MANUAL

GOBLIN 420 RAW

GOBLIN

SABGROUP

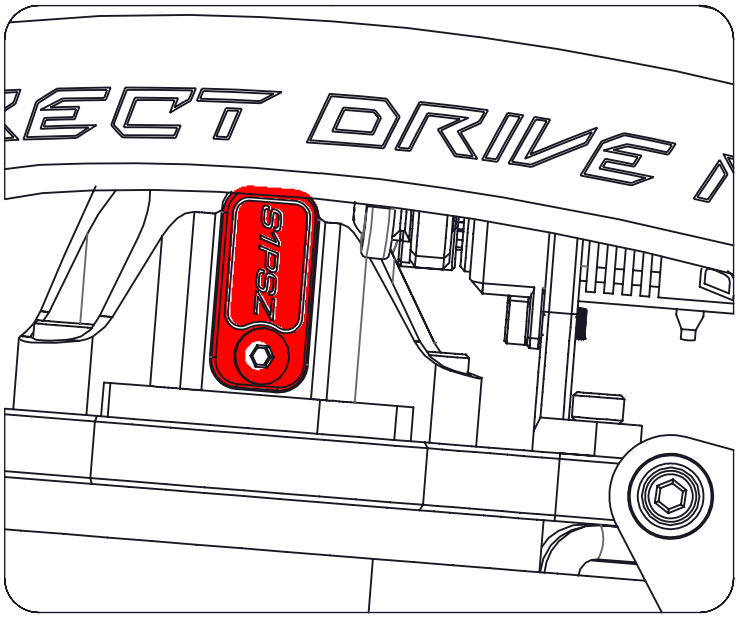
Direct Drive

GOBLIN

RAW DD

SAB HELI DIVISION

Please read this user manual carefully, it contains instructions for the correct assembly of the model.
Please refer to the web site *www.goblin-helicopter.com* for updates and other important information.



VERY IMPORTANT

You will find your serial number on the RED plate inside the bag for page 7.
Please take a moment to register your kit online via our web site at:

http://www.goblin-helicopter.com

It is extremely important that you take a moment to register your helicopter with us. This is the only way to ensure that you are properly informed about changes to your kit, such as upgrades, retrofits and other important developments. SAB Heli Division cannot be held responsible for any issues with your model and will not provide support unless you register your model.

The Serial number is also engraved in the Aluminum part.

Thank you for your purchase, we hope you enjoy your new Goblin helicopter!

SAB Heli Division

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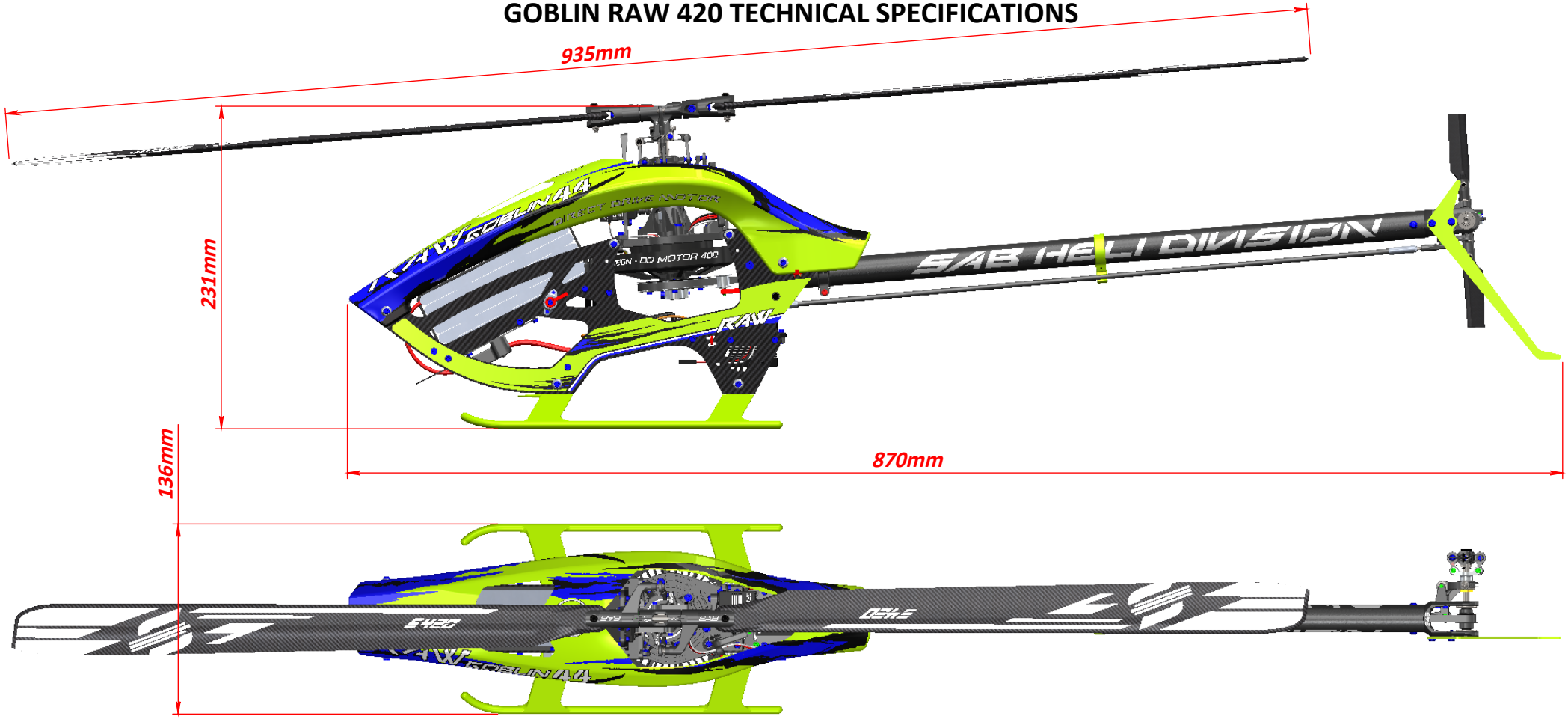
GOBLIN RAW 420 TECHNICAL SPECIFICATIONS



- **AIRFRAME weight:** 1000gr (with blades and motor, no battery and electronics).
- **Main rotor diameter:** 935mm (with 420 mm blades).
- **Main blade length:** 380 to 420 mm.
- **Tail rotor diameter:** 190 mm (with 70 mm tail blades).
- **Tail blade length:** 55 to 70 mm.

KIT Includes:

- 1 Competition Motor.
- 1 Battery Tray with straps and connectors.

- **Cyclic Servos:** Micro size 23 mm.
- **Tail Servo:** Mini size 35 mm.
- **Main Rotor Ratio :** 1 : 1 Direct Driver Motor.
- **Tail Rotor Ratio :** 4 : 1.
- **Maximum battery size:** 40x54x135mm.
- **Recommended battery:** 6S 2200/2700 mAh.
- **Recommended battery weight:** approximately 350-420gr.

- 420mm Main Blades.
- 70mm Tail Blades.

DISCLAIMER

* This radio-controlled helicopter is not a toy.
* This radio-controlled helicopter can be very dangerous.
* This radio-controlled helicopter is a technically complex device which must be built and handled very carefully.
* This radio-controlled helicopter must be built following these instructions. This manual provides the necessary information to correctly assemble the model.
* Inexperienced pilots must be monitored by expert pilots.
* A radio-controlled helicopter must only be used in open spaces without obstacles, and far enough from people to minimize the possibility of accidents or of injury.
* A radio-controlled helicopter can behave in an unexpected manner, causing loss of control of the model, making it very dangerous.
* Lack of care with assembly or maintenance can result in an unreliable and dangerous model.
* Fly only in areas dedicated to the use of model helicopters.
* Follow all control procedures for the radio frequency system.
* It is necessary that you know your radio system well. Check all functions of the transmitter before every flight.
* The blades of the model rotate at a very high speed; be aware of the danger they pose and the damage they may cause.
* Never fly in the vicinity of other people

ASSUMPTION OF RISK

Neither SAB Heli Division nor its agents have any control over the assembly, maintenance, and use of this product.
For this reason, SAB Heli Division is not responsible for injury, death or damage to people, things and / or to the product.
By assembling any component of this product, the user declares to have read and understood the following terms and conditions and agrees to be bound by them.
Failure to observe the above warnings and precautions may increase the risk of serious injury or death to yourself or surrounding people, damage to the product, or both.
SAB Heli Division shall not even be liable for special, indirect, or consequential damages, loss of profits or production or commercial loss in any way connected with the product, whether such claim is based in contract, warranty, negligence, or strict liability.
Further, in no event shall the liability of SAB Heli Division exceed the individual price of the Product on which liability is asserted.
By the act of use, setup, or assembly the user accepts all resulting liability.
Therefore, no responsibility can be traced back to the manufacturer.
You hereby agree to release SAB Heli Division from any responsibility or liability arising from the use of this product.
If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new an unused condition to the place of purchase.

WARRANTY

SAB Heli Division reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. Replacement as provided under this warranty is the exclusive remedy of the purchaser This warranty covers only those products purchased from an authorized SAB Heli Division dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims.

(b) Limitations
SAB Heli Division makes no warranty or representation, express or implied, about non infringement, merchantability, or fitness for a particular purpose of the product. The purchaser acknowledges that they alone have determined that the product will suitably meet the requirements of the purchaser's intended use.

(c) Purchaser Remedy
SAB Heli Division's sole obligation hereunder shall be that SAB Heli Division will, at its option, replace any Product determined by SAB Heli Division to be defective in the event of a defect, this is the Purchaser's exclusive remedy. Replacement decisions are at the sole discretion of SAB Heli Division. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone.

ADDITIONAL COMPONENTS REQUIRED

*Speed controller: 6S capable, 60-80 Amps.

*Batteries: 6S 2200/2700 mAh.

*1 flybarless 3 axis control unit.

*Radio power system.

*3 Micro cyclic servos.

*1 Mini tail rotor servo.

*6 channel radio control system on 2.4 GHz.

TOOLS, LUBRICANTS, ADHESIVES

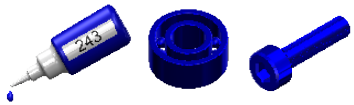
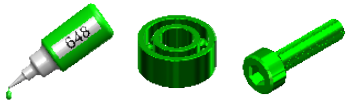
*Generic pliers.
*Hexagonal driver, size 1.5, 2, 2.5, 3mm.
*4/5mm T-Wrench.
*5.5mm Socket wrench (for M3 nuts).
*8mm Hex fork wrench (for M5 nuts).

*Medium threadlocker (SAB p/n HA116-S).
*Strong retaining compound (SAB p/n HA115-S).
*Spray lubricant (eg. Try-Flow Oil).
*Synthetic grease (eg. Microlube 261).
*Cyanoacrylate adhesive.

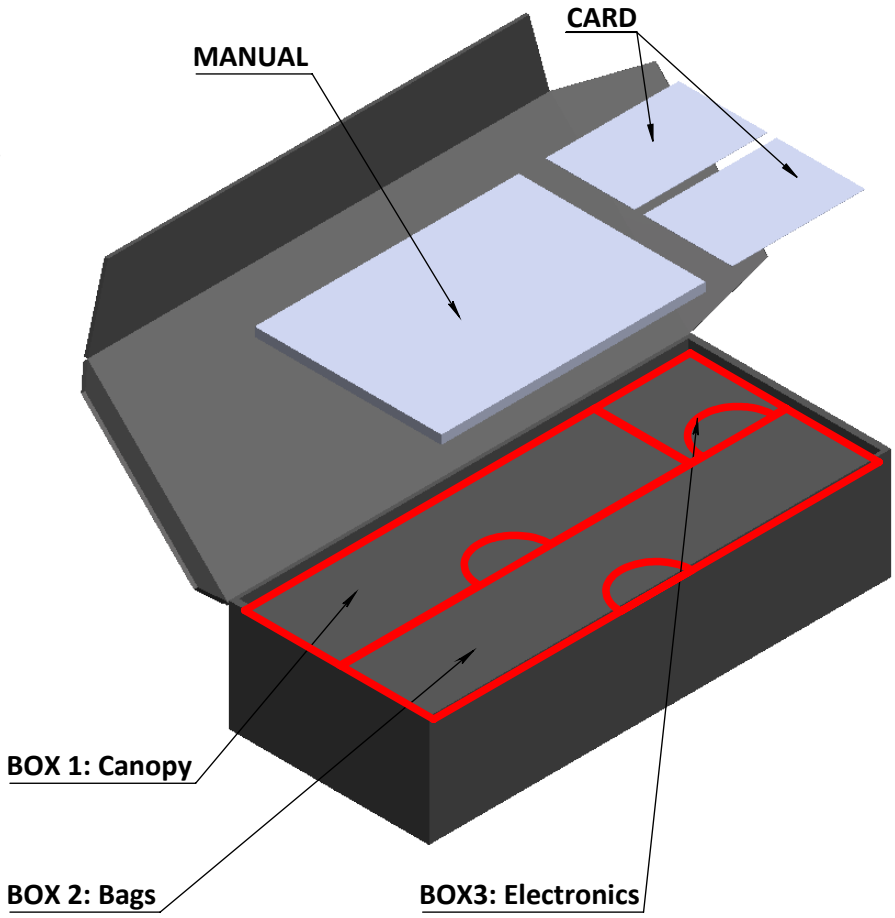
*Pitch Gauge (for set-up).
*Soldering equipment (for motor wiring).

NOTES FOR ASSEMBLY

Please refer to this manual for assembly instructions for this model. Follow the order of assembly indicated. The instructions are divided into chapters, which are structured in a way that each step is based on the work done in the previous step. Changing the order of assembly may result in additional or unnecessary steps.Use thread lockers and retaining compounds as indicated. In general, each bolt or screw that engages with a metal part requires thread lock. It is necessary to pay attention to the symbols listed below:

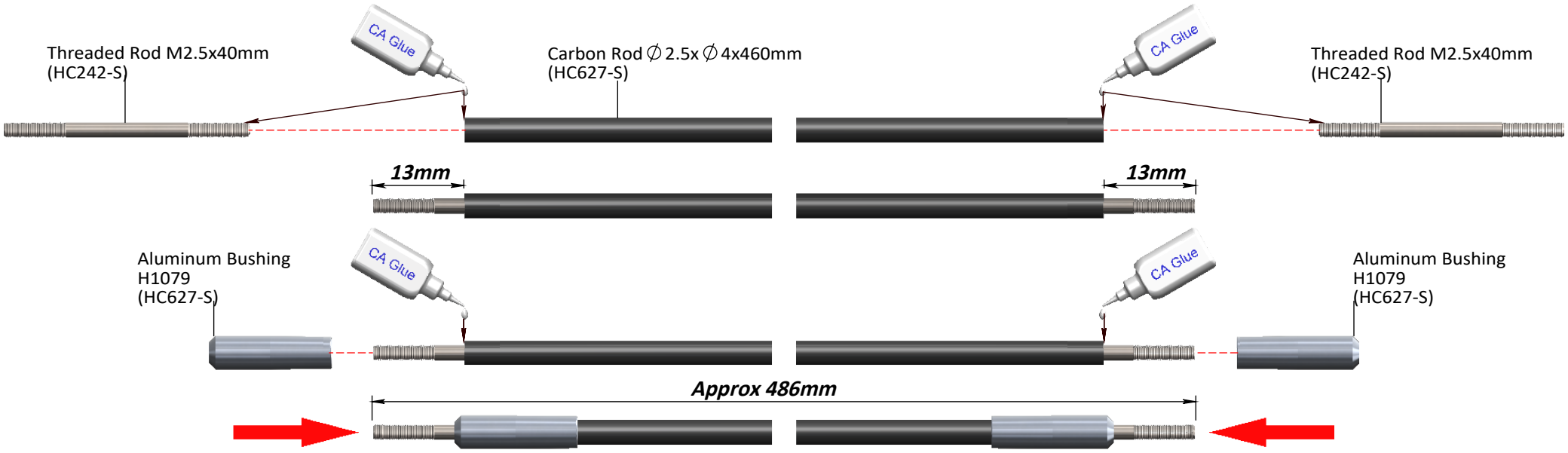
Important	 Blue screw and blue bearing in the illustration means you need to use: **Thread Locker Medium Strength (SAB HA116-S)**	 Green screw and Green bearing in the illustration means you need to use: **Retaining compound (SAB HA115-S)**
BOX XX, BAGXX Indicates that for this assembly phase you need materials that are: BOX xxx, BAG xxx.	 Use CA Glue	 Use Proper Lubricant

INSIDE THE MAIN BOX THERE ARE:



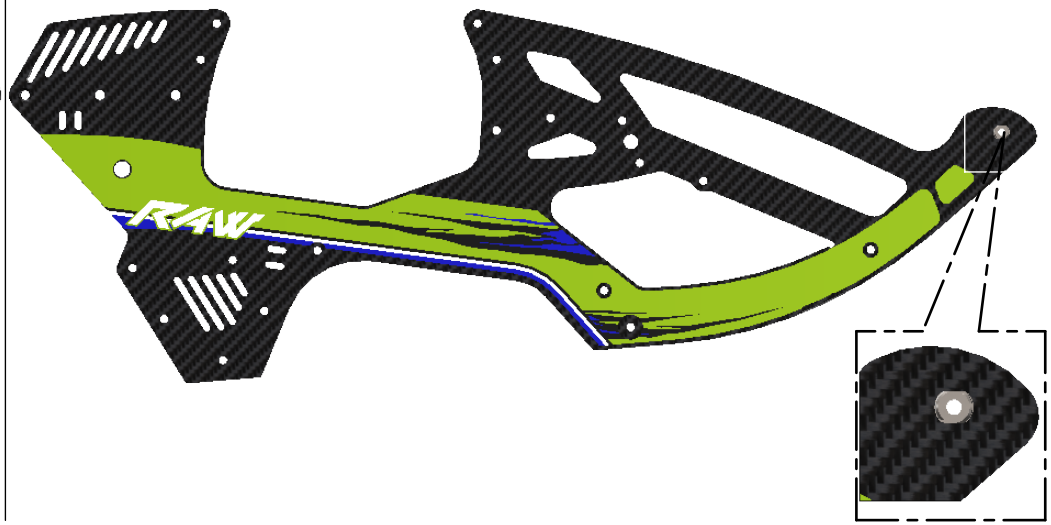
The assembly process is described in the following chapters. Each chapter provides you with the box, bag and/or foam numbers you will need for that chapter. The information is printed in a black box in the upper corner of the page.

Box 2, Bag for page 5

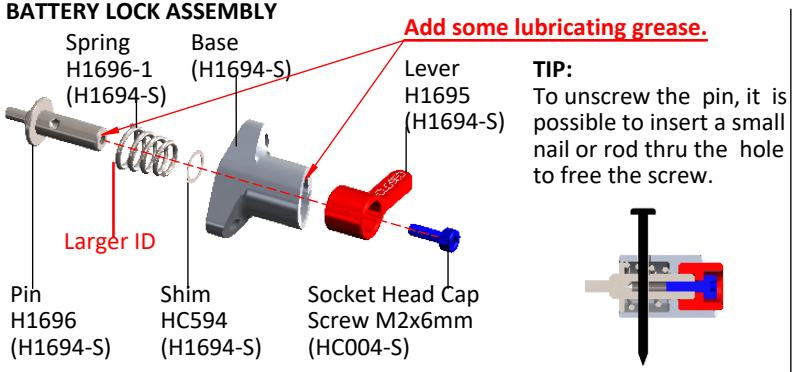


LEFT MAIN FRAME STICKER (Bag for page 6)

RIGHT MAIN FRAME STICKER (Bag for page 6)

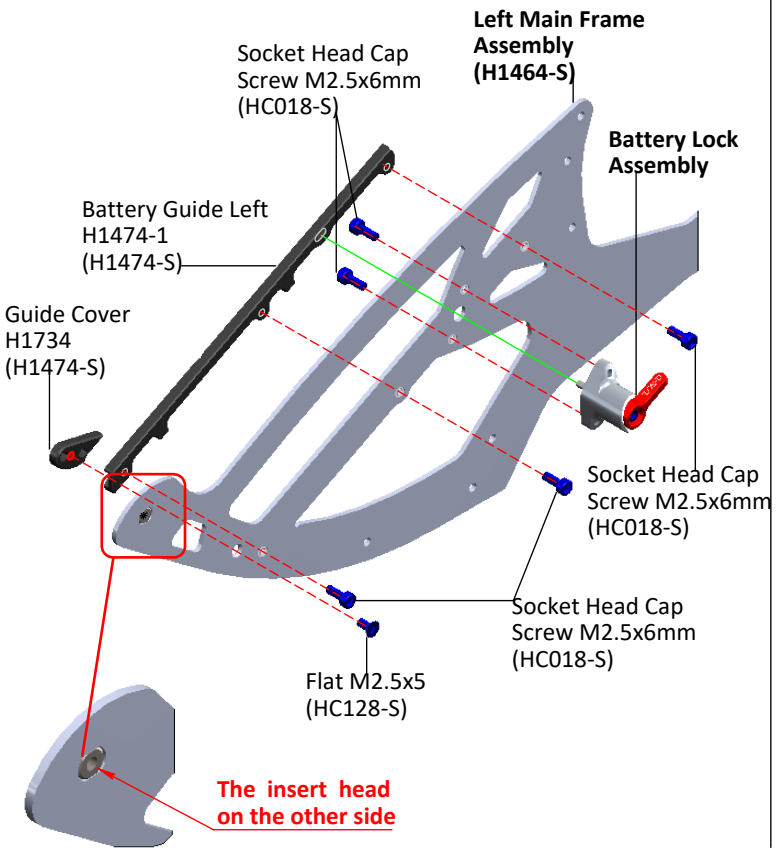


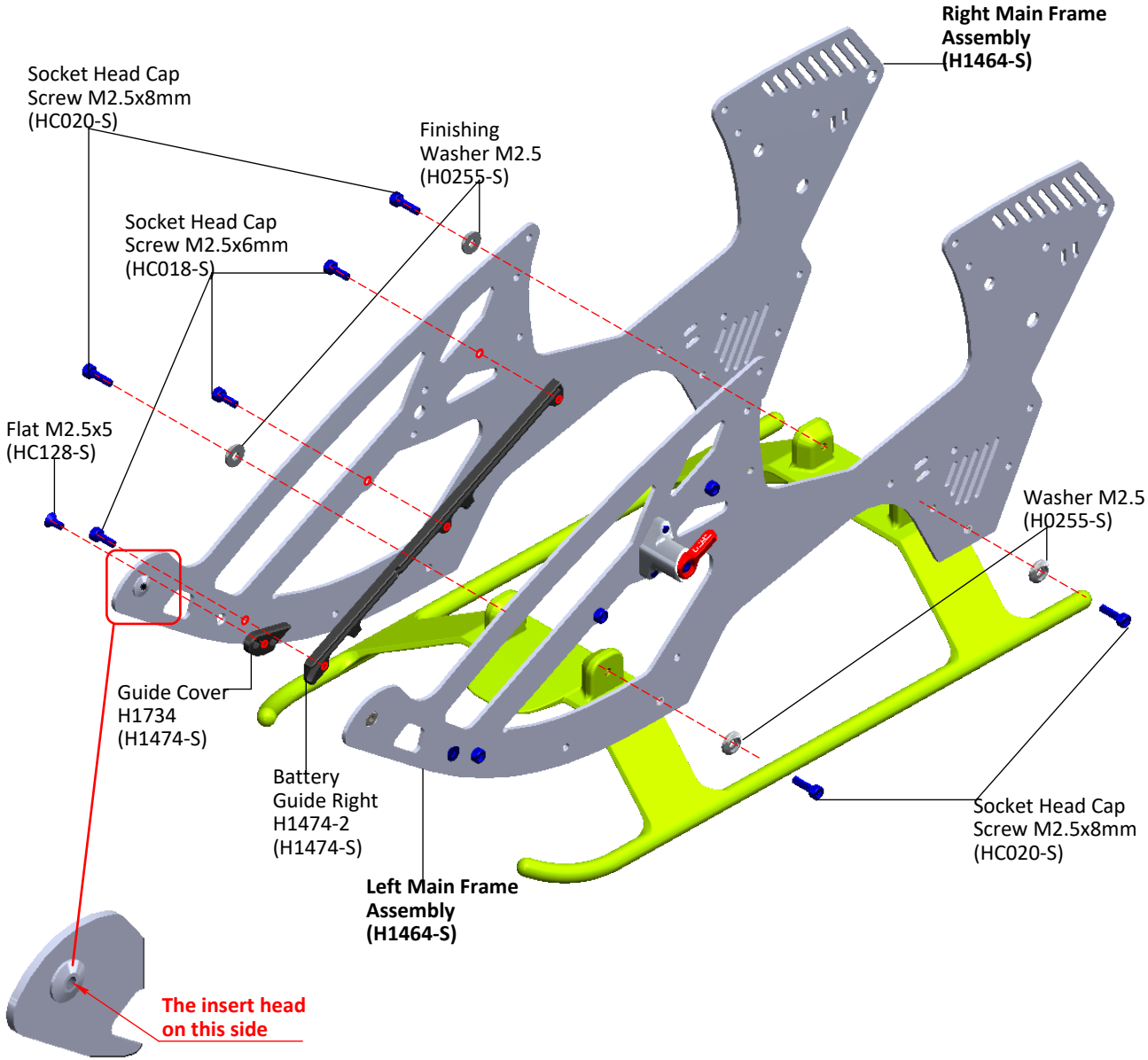
BATTERY LOCK ASSEMBLY



TIP:
To unscrew the pin, it is possible to insert a small nail or rod thru the hole to free the screw.

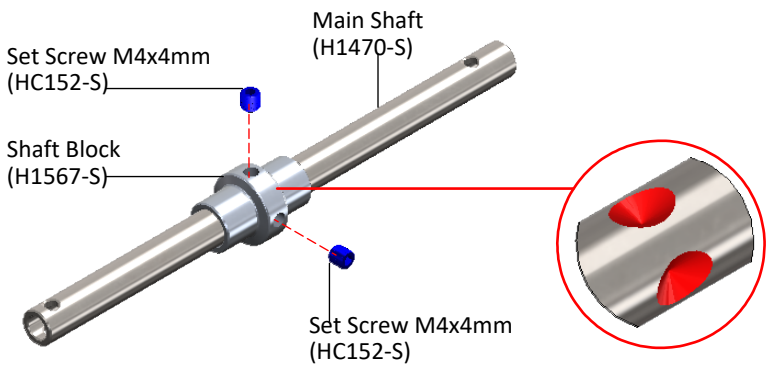
LEFT MAIN FRAME ASSEMBLY





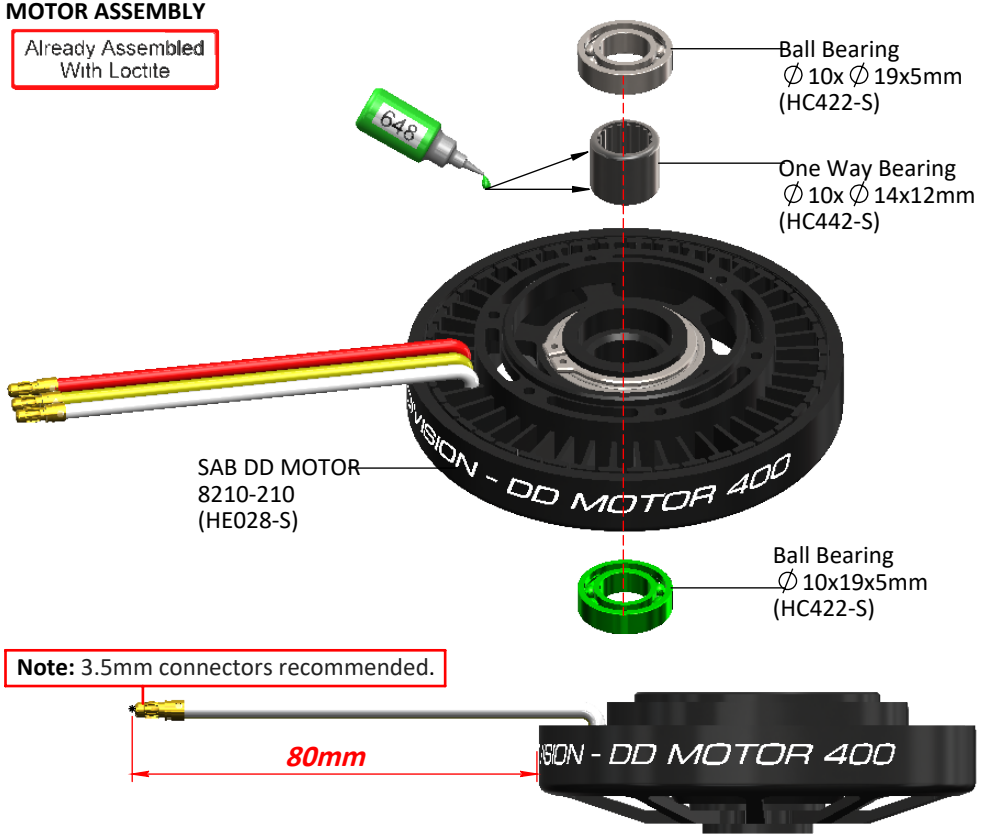
BOX 2,3, BAG FOR PAGE 7

MAIN SHAFT ASSEMBLY

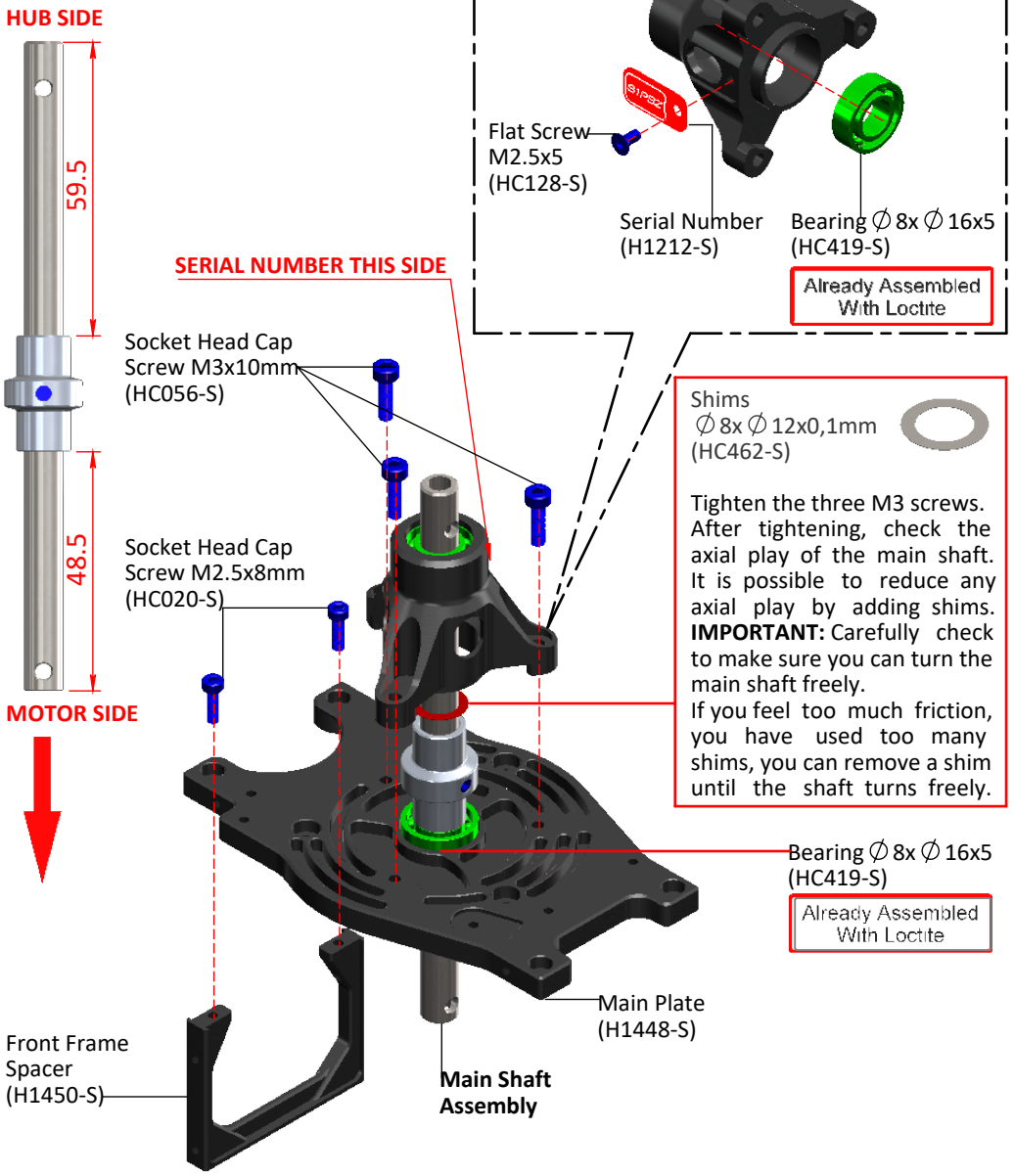


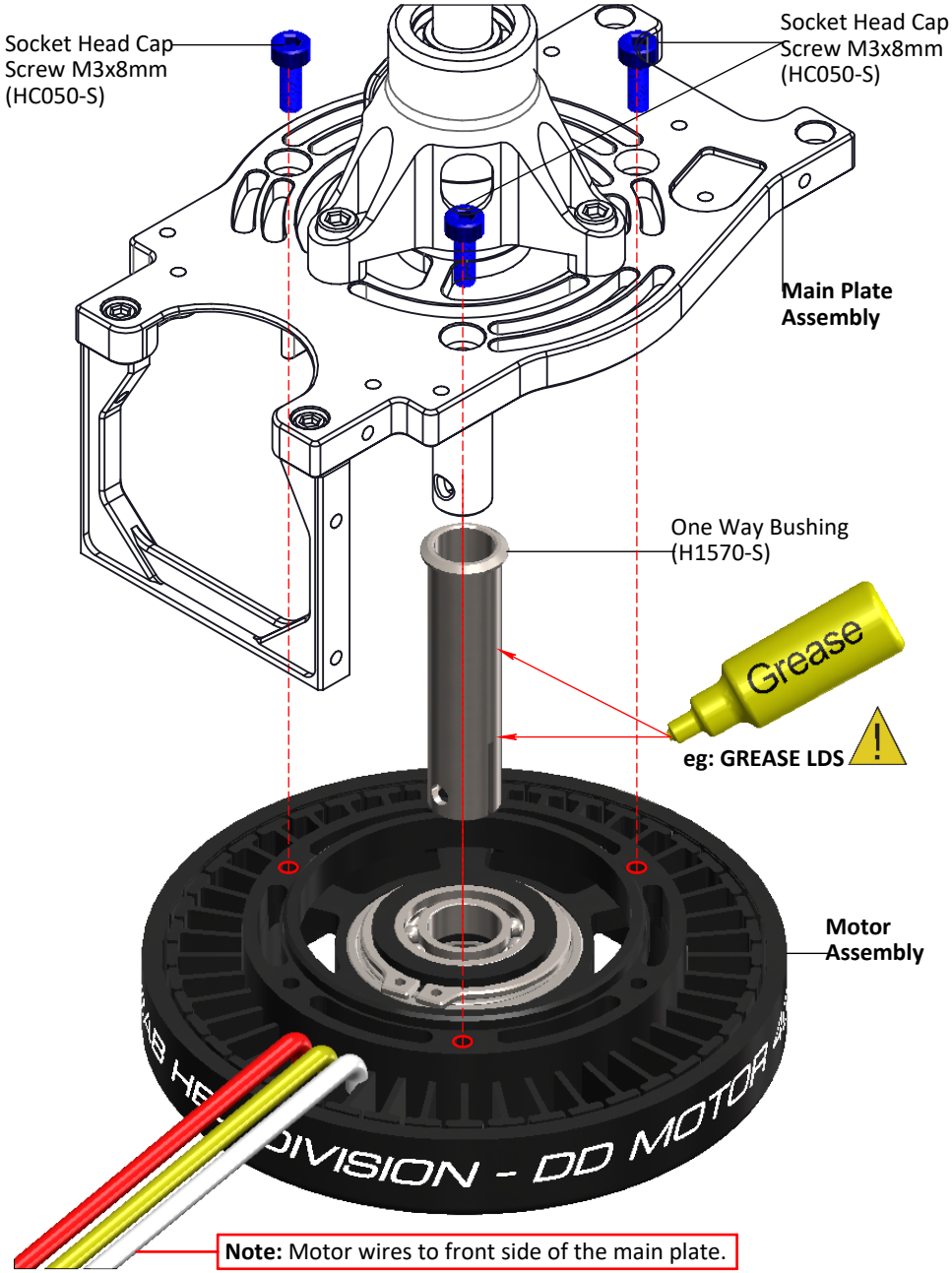
MOTOR ASSEMBLY

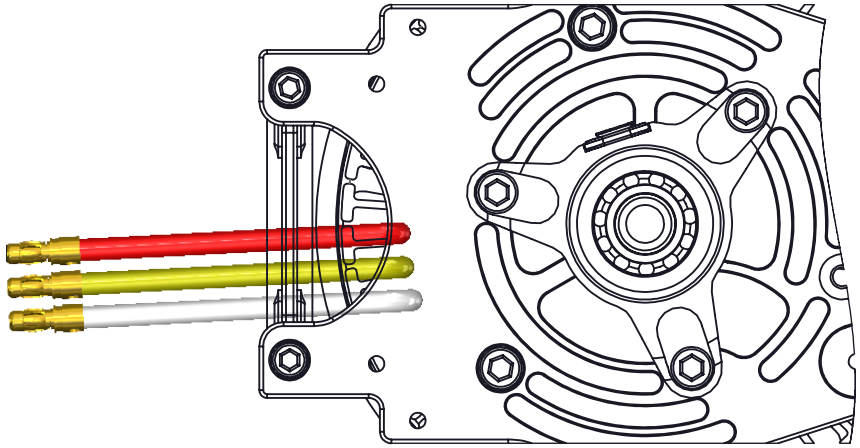
Already Assembled With Loctite

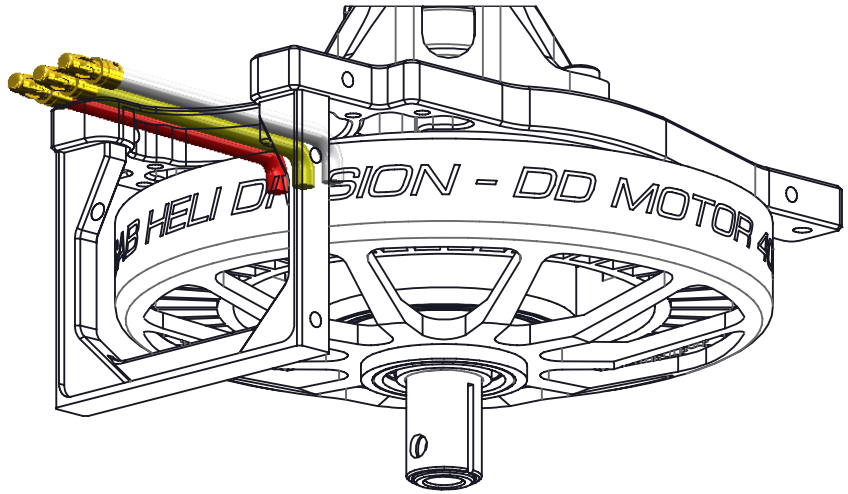


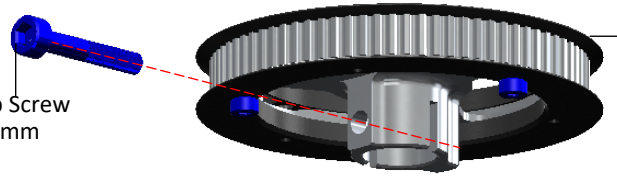
MAIN PLATE ASSEMBLY




Socket Head Cap Screw M3x8mm (HC050-S)
Socket Head Cap Screw M3x8mm (HC050-S)
Main Plate Assembly
One Way Bushing (H1570-S)
Grease
eg: GREASE LDS
Motor Assembly
Note: Motor wires to front side of the main plate.



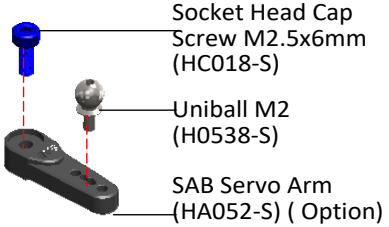


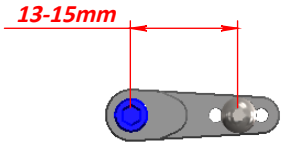

Socket Head Cap Screw Shoulder M3x18mm (HC079-S)
Front Tail Pulley (H1571-S)
Already Assembled With Loctite

Box 2,3 , Bag for page 9

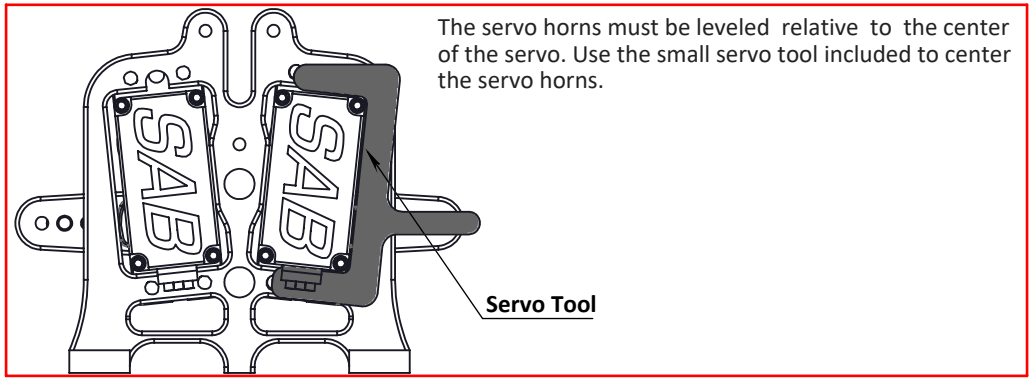
SERVO ASSEMBLY

The linkage ball must be positioned 13-15mm out on the servo arm.
The recommended servo arm to use is: SAB p/n [HA052].
Ensure the alignment of the servo arms before installation of the servos in the model.
Proceed with installation following the instructions below.

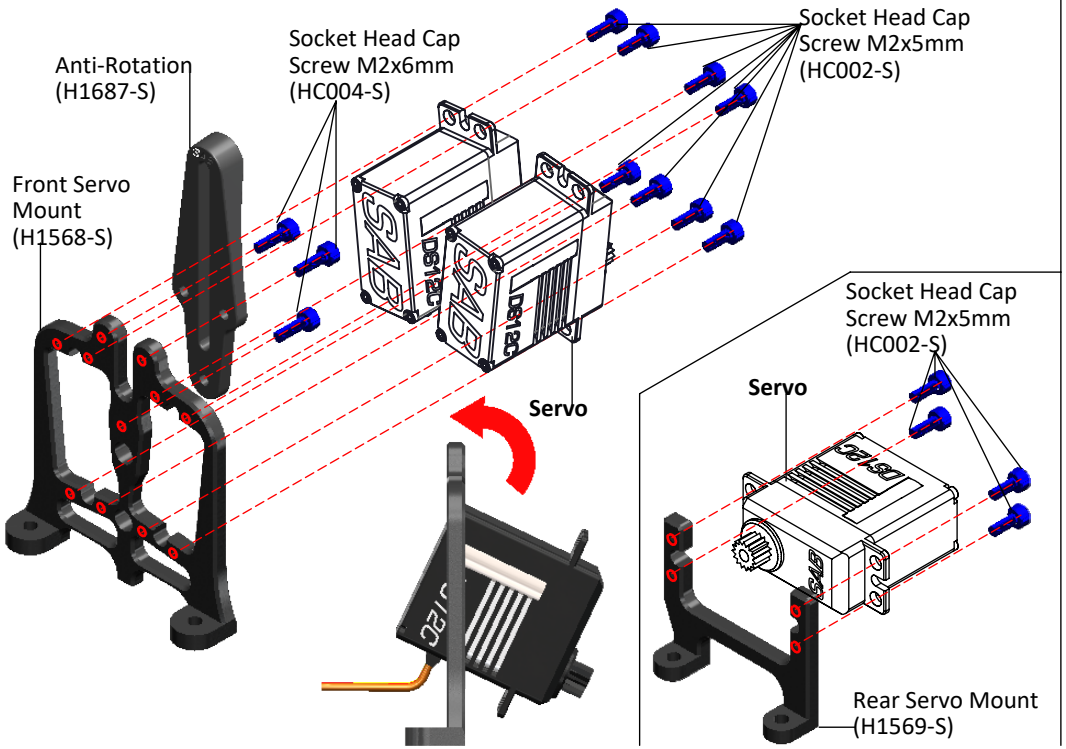


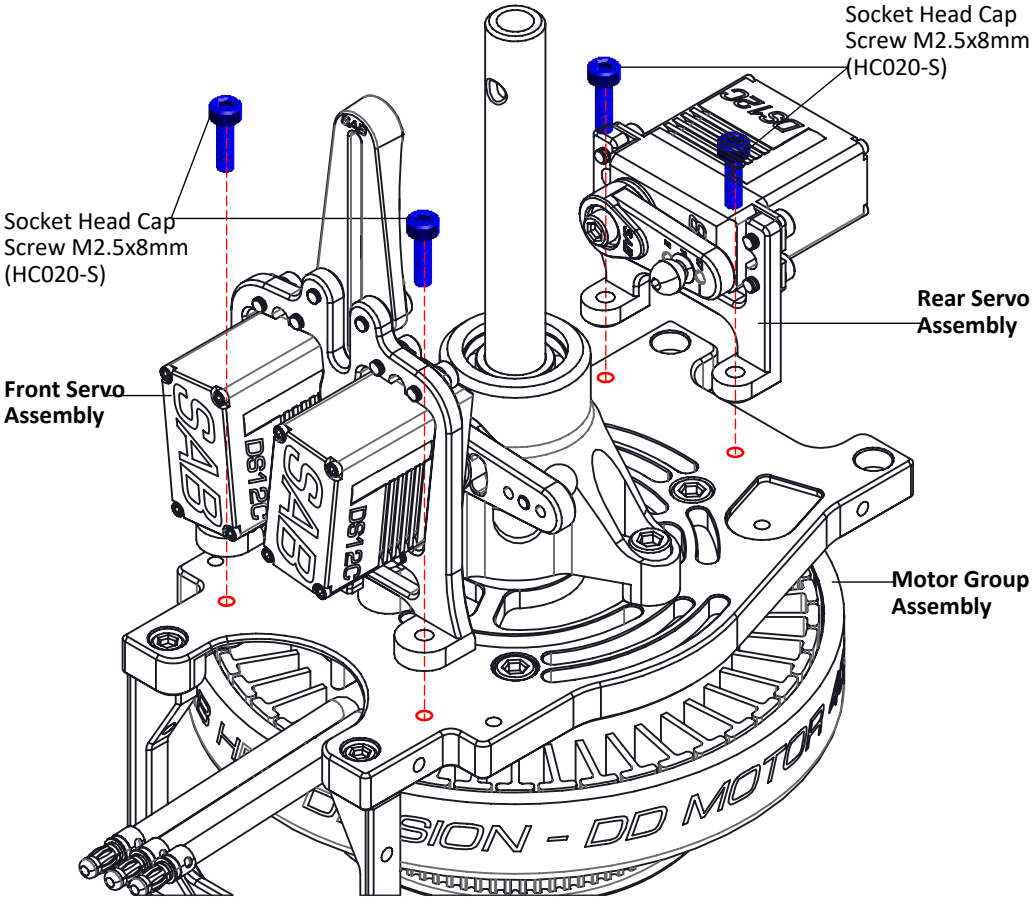


Note: Do not over tighten the uniball, be careful not to strip the plastic

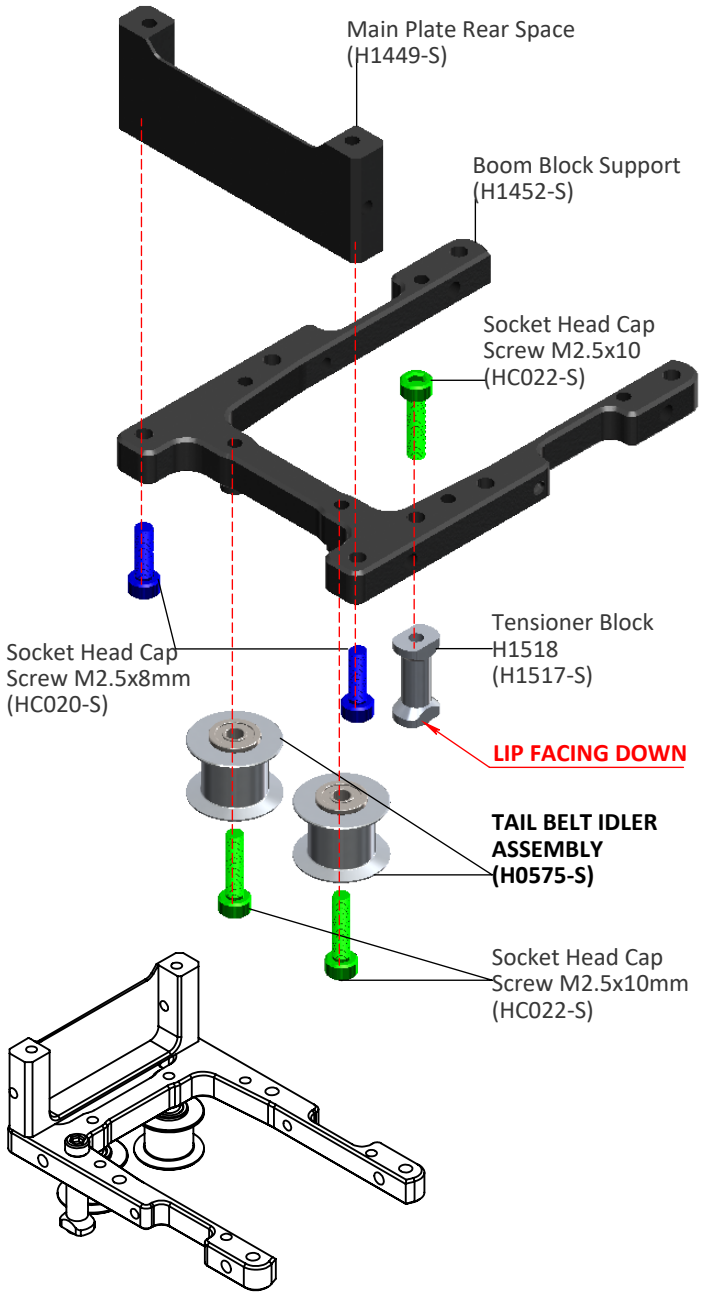


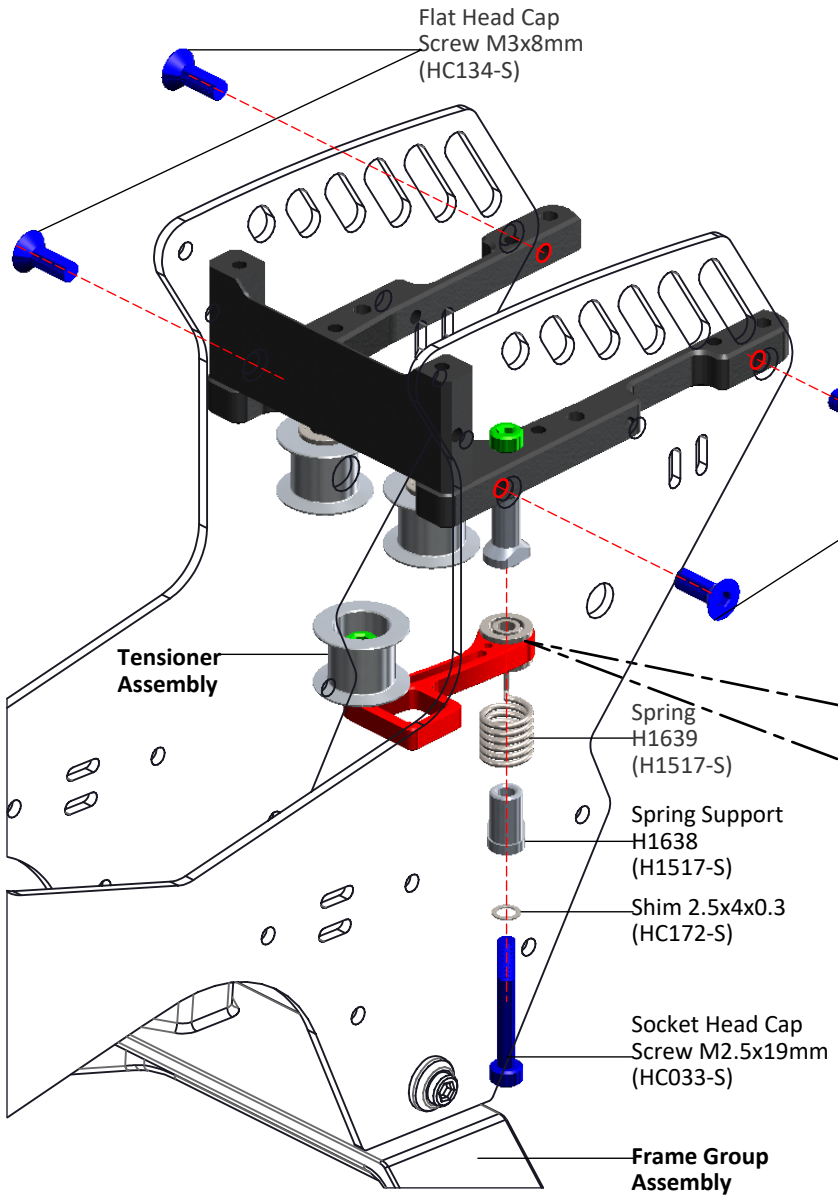
The servo horns must be leveled relative to the center of the servo. Use the small servo tool included to center the servo horns.

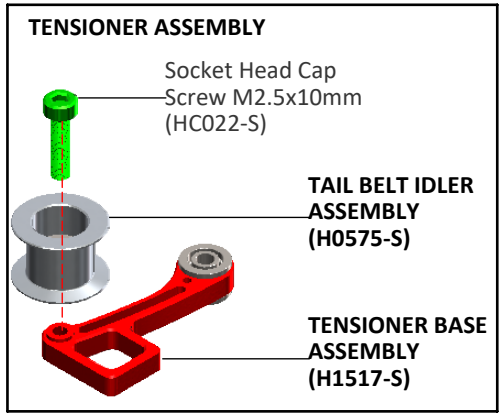


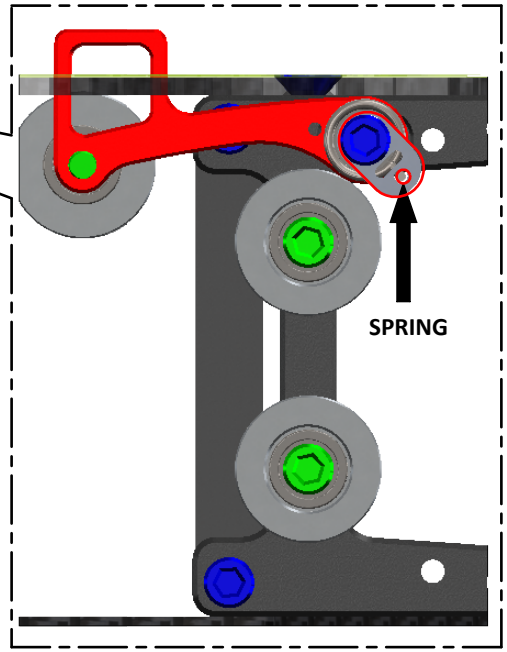


BOX 2, BAG FOR PAGE 10

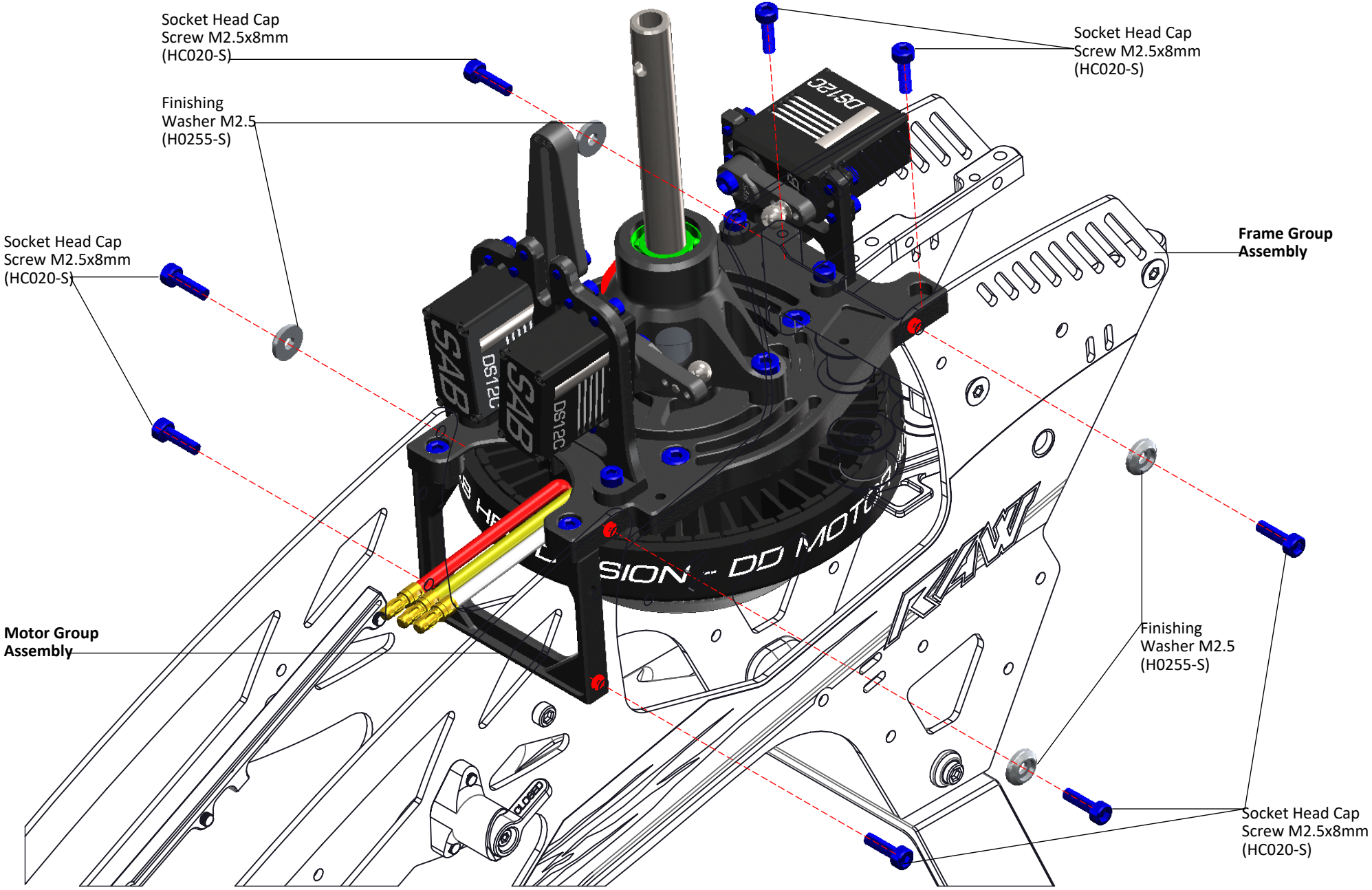




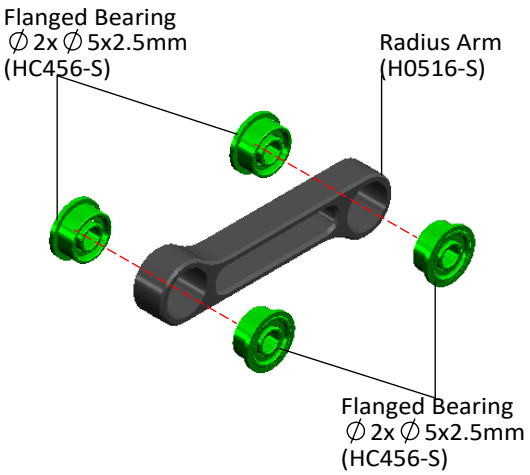




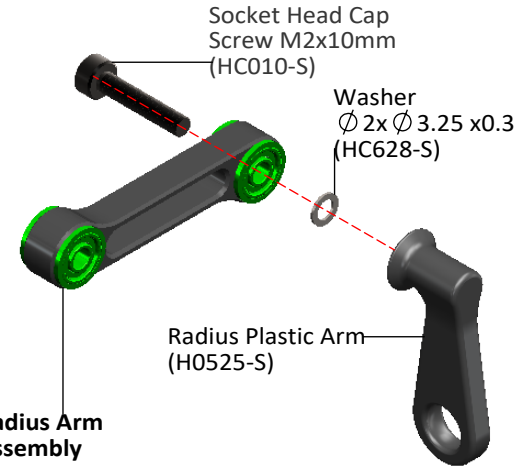
BOX 2, BAG FOR PAGE 11



RADIUS ARM ASSEMBLY ... x2

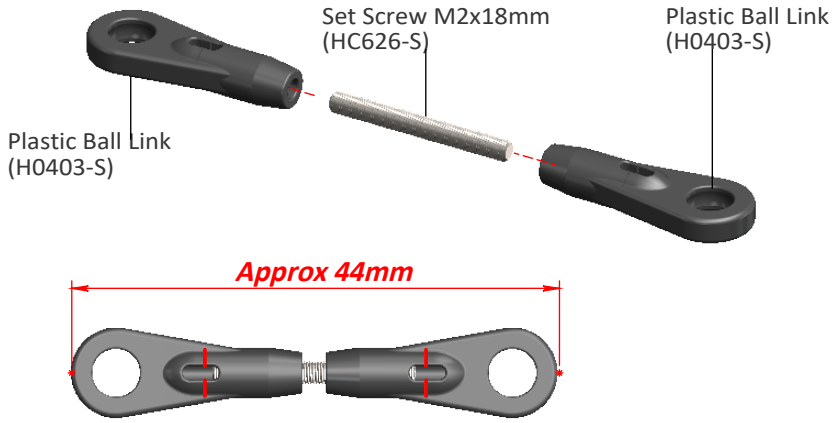


RADIUS PLASTIC ARM ASSEMBLY ... x2



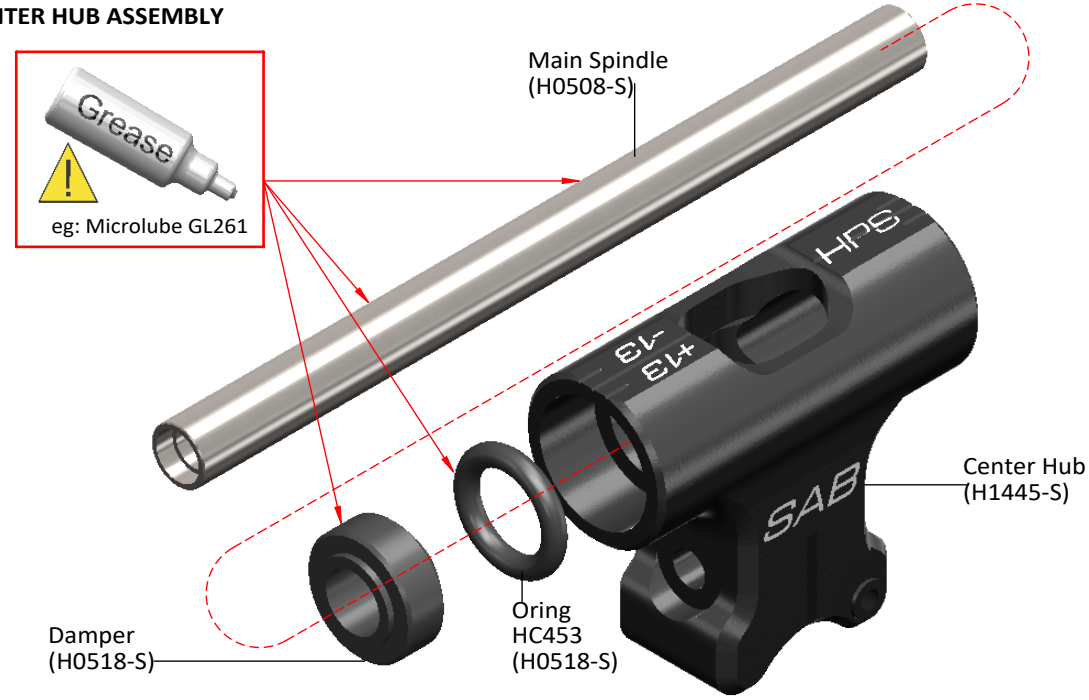
NOTE: Tighten with care, the arm must move freely.

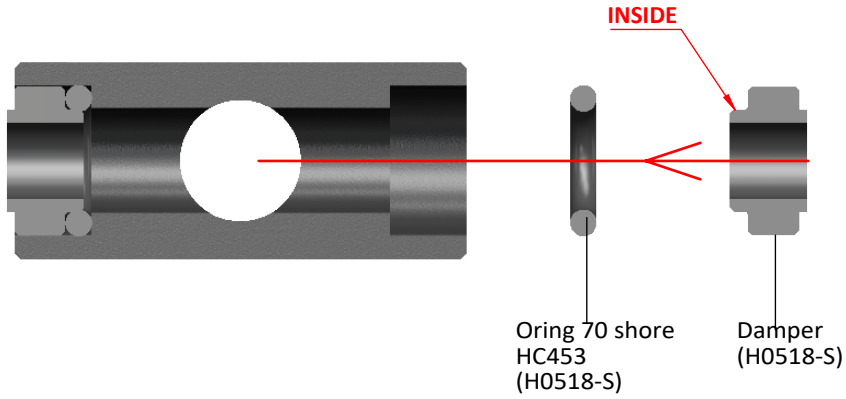
LINKAGE ROD ASSEMBLY x2



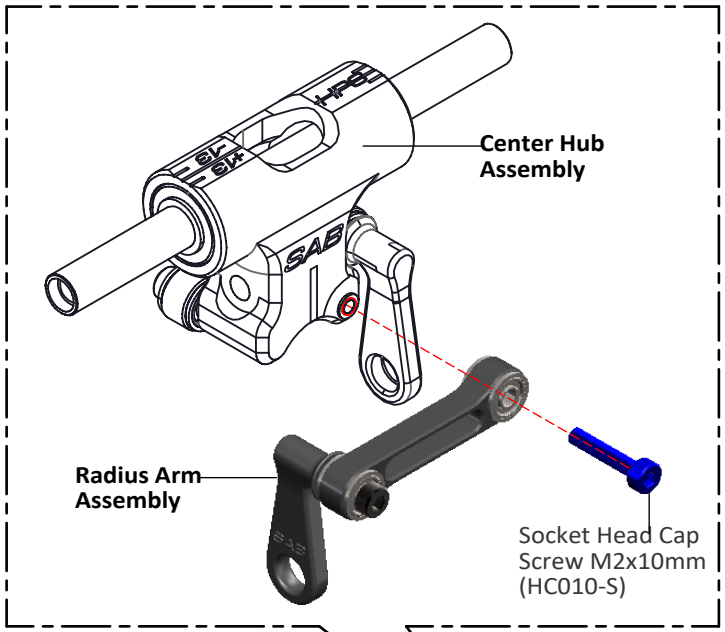
(Initial length for the rods from the swashplate to the Blade Grip.)

CENTER HUB ASSEMBLY





Box 2, Bag for page 13



NOTE: We recommend assembling without shims.
After approximately 20/30 flights, please manually check the head dampening, you can add one 0.1mm shim each side (HC450) if the dampening feels loose.

Thrust Bearing
∅5x∅10x4mm
(HC435-S)

Washer ∅7.5x∅10x0.5
H0349
(H1446-S)

Button Head Cap Screw M4x6mm
(HC096-S)

SMALLER ID

LARGER ID

Grease
eg: Microlube GL261

Main Blade Grip
(H1446-S)

Washer
∅5x∅7x0.1
(HC450-S)

Ball Bearing
∅5x∅10x4mm
(HC411-S)
Already Assembled With Loctite

Ball Bearing
∅5x∅10x4mm
(HC411-S)
Already Assembled With Loctite

Socket Head Cap Screw M3x6mm
(HC044-S)

Uniball M2
(H0538-S)

Linkage Rod Assembly

Main Blade Grip Arm
(H1701-S)

The blade grim arms are made of carbon plastic, they provide high strength and rigidity, but are sacrificial in the event of the crash saving more expensive parts.

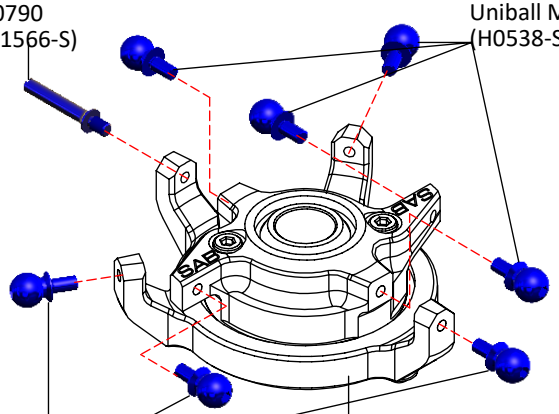
Do not over tighten the uniball and the screw.

BOX 2, BAG FOR PAGE 14

SWASHPLATE ASSEMBLY

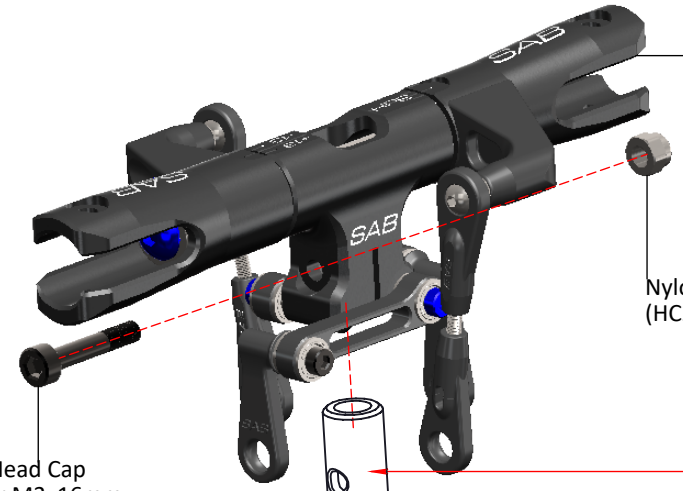
Anti-Rotation Pin
H0790
(H1566-S)

Uniball M2
(H0538-S)



Uniball M2
(H0538-S)

Swashplate Assembly
(H1566-S)

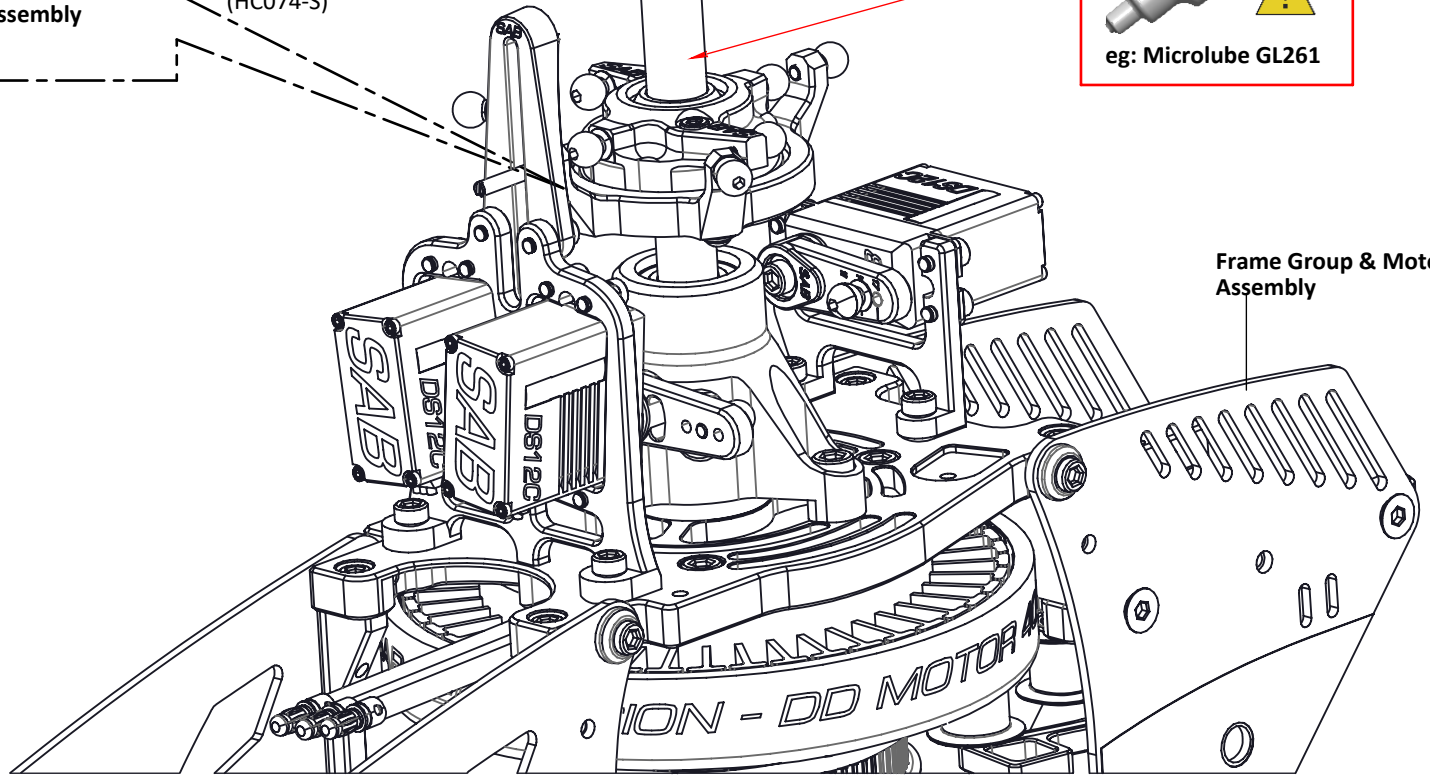


Head Group Assembly

Nylon Nut M3
(HC206-S)

Socket Head Cap
Shoulder M3x16mm
(HC074-S)

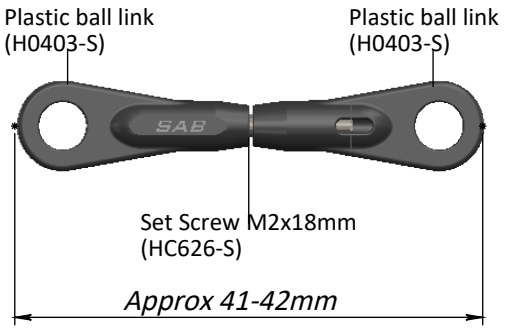
eg: Microlube GL261



Frame Group & Motor Group Assembly

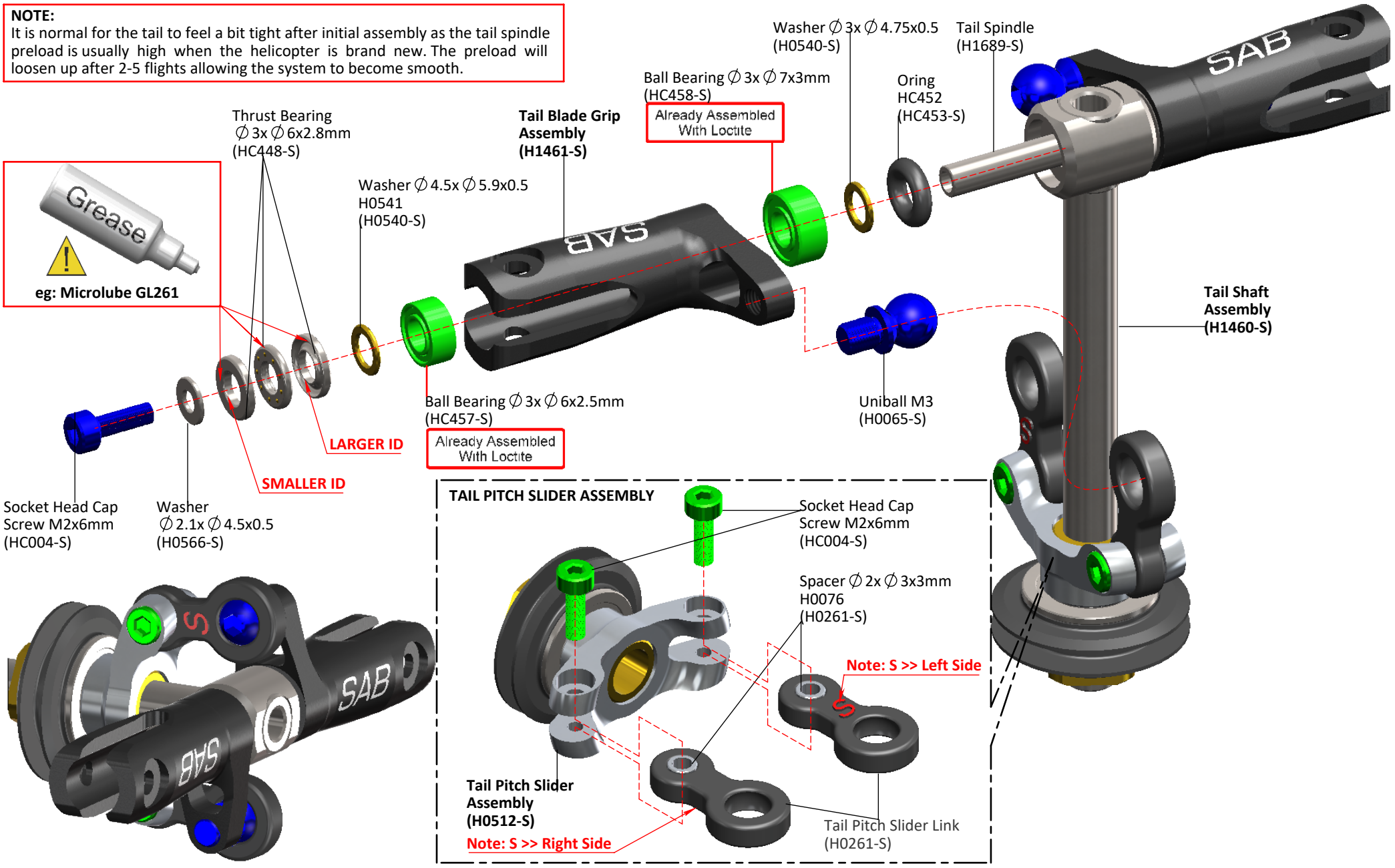
Box 2, Bag for page 15

LINKAGE ROD B ASSEMBLY ... X3

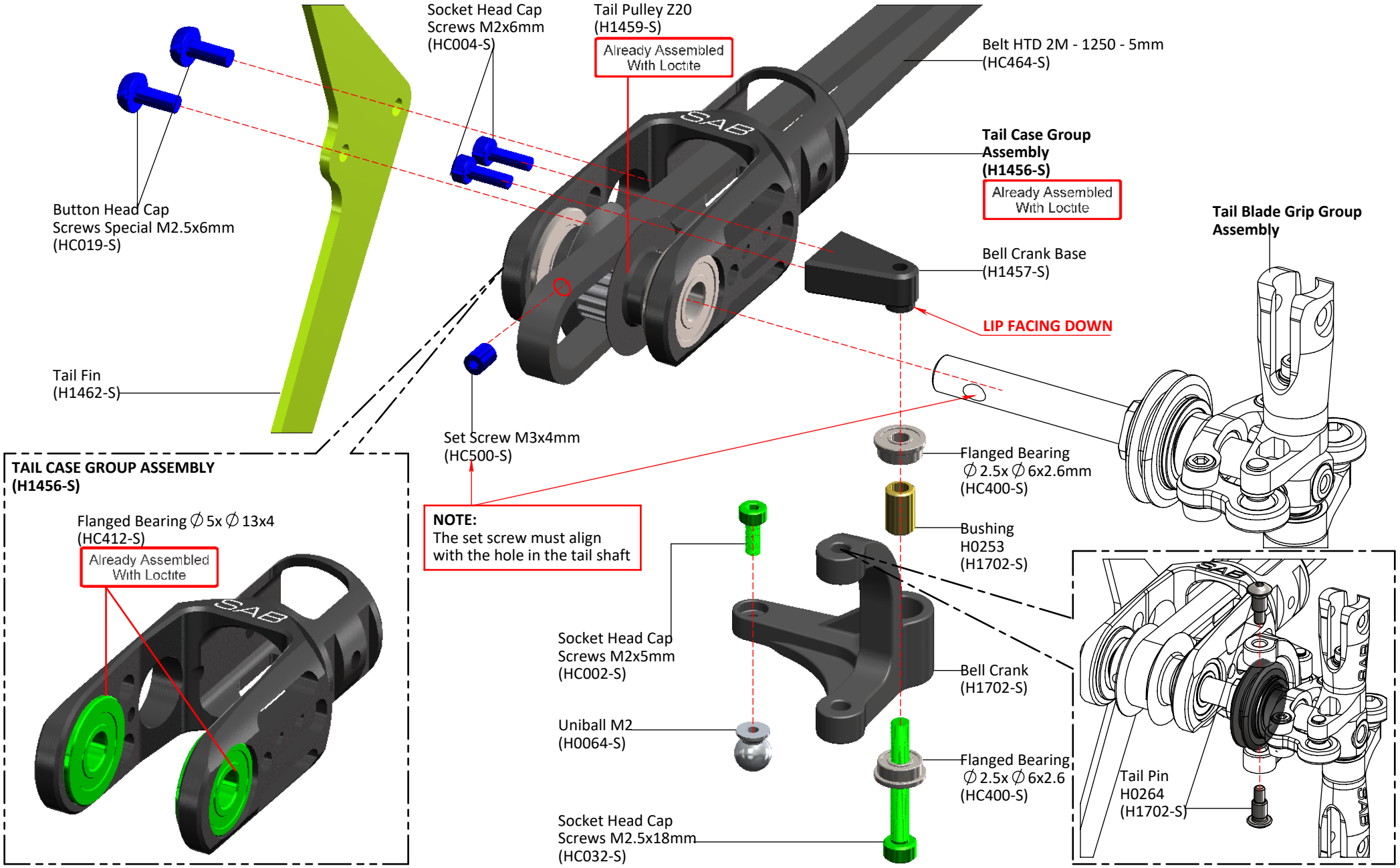


Initial length for the rods from the servos to the swash plate.

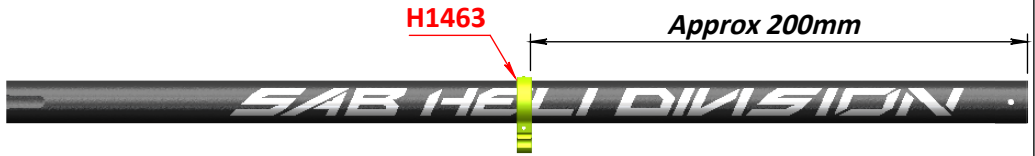
NOTE:
It is normal for the tail to feel a bit tight after initial assembly as the tail spindle preload is usually high when the helicopter is brand new. The preload will loosen up after 2-5 flights allowing the system to become smooth.

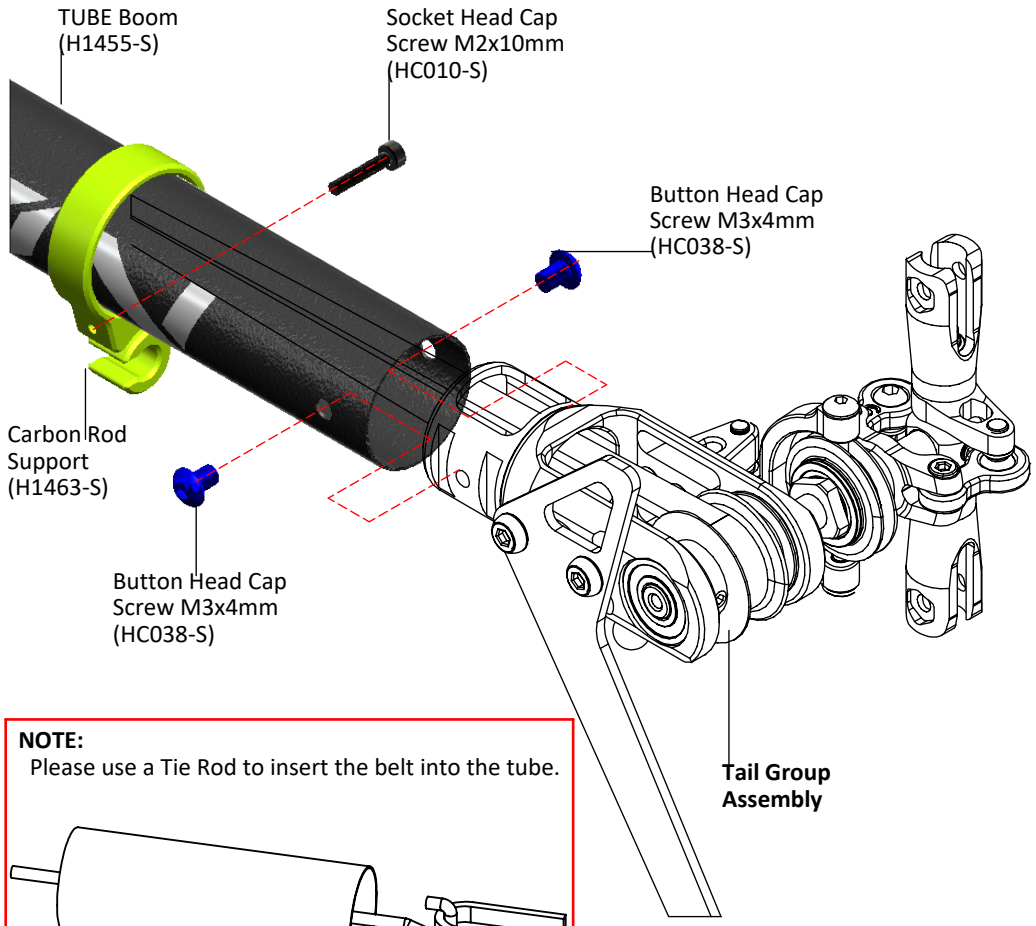


BOX 2, BAG FOR PAGE 17



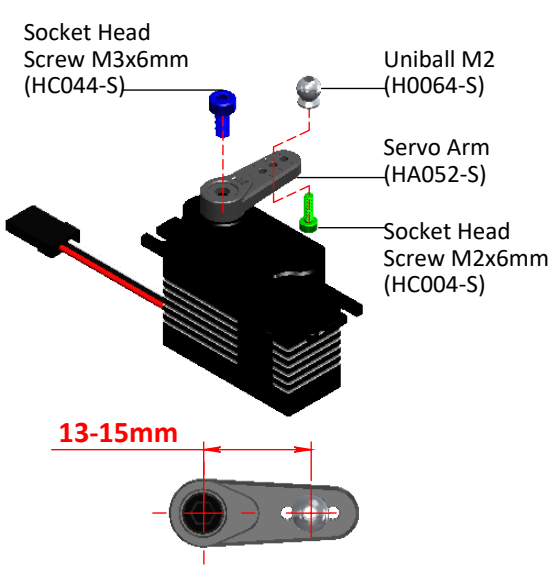
BOX 2, BAG FOR PAGE 18

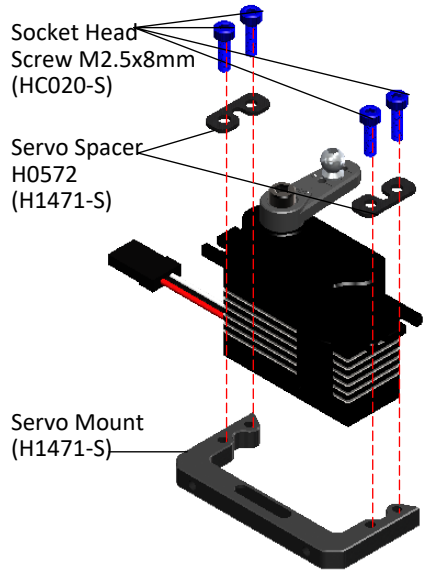


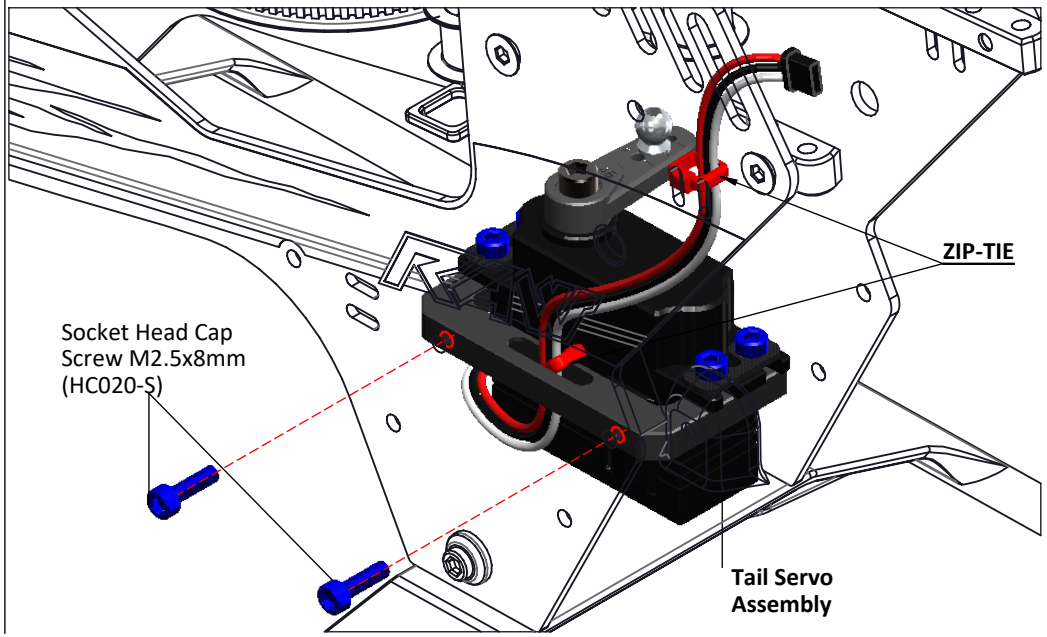


NOTE:
Please use a Tie Rod to insert the belt into the tube.

TAIL SERVO ASSEMBLY



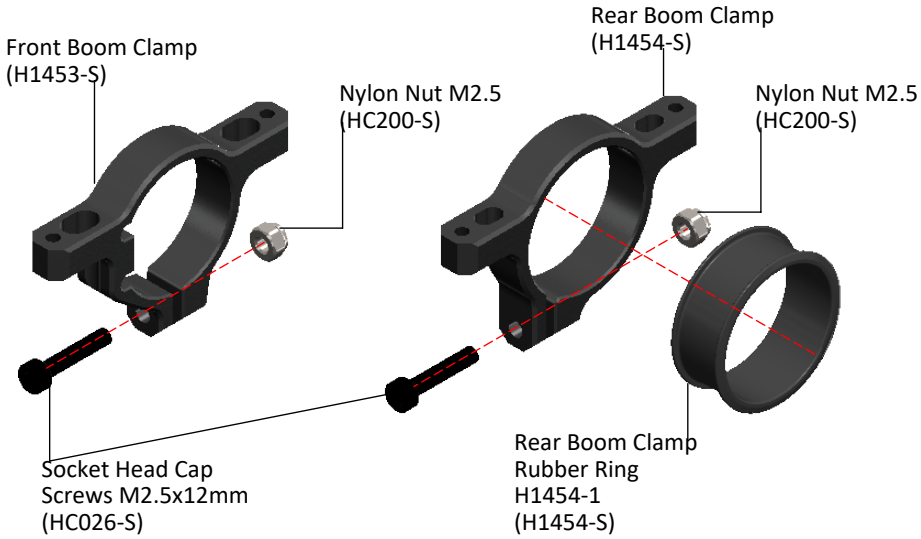


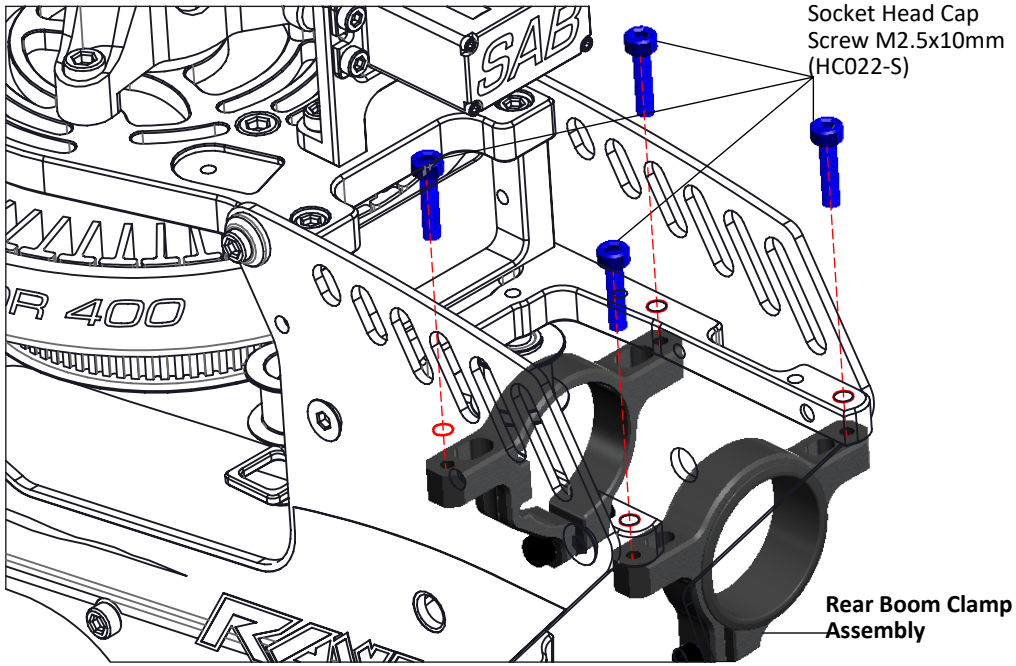


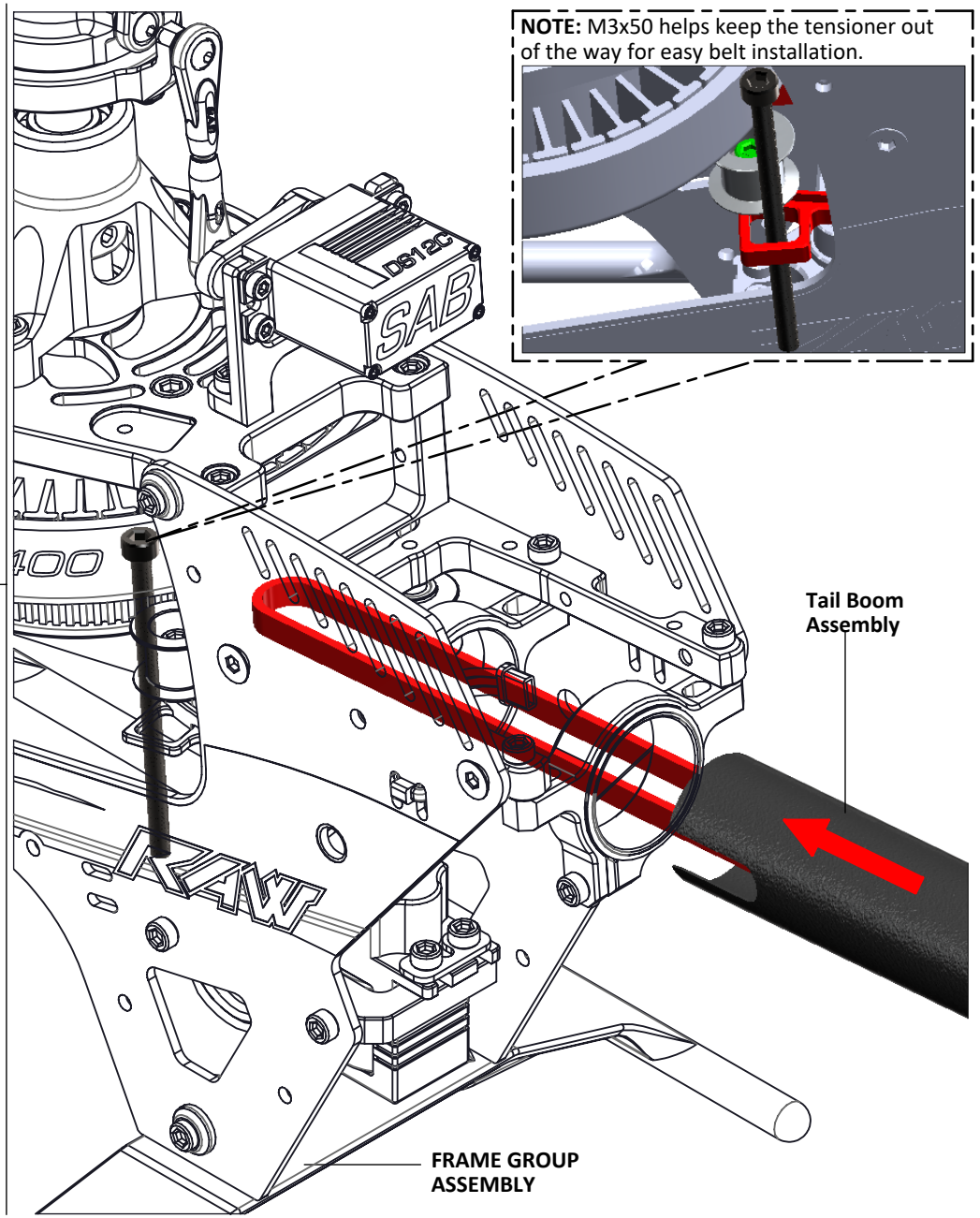
Box 2, Bag for page 19

BOOM CLAMP ASSEMBLY

NOTE: Do not tighten the M2.5x12 at this moment.







TAIL BOOM ASSEMBLY

*Use the M3 screws to open the tail belt tensioner (See page 19).
*Install the belt onto the tail front pulley, checking the direction of rotation.
Rotate the belt 90 ° counterclockwise (**Fig. 1**).
*Rotate the main rotor several times by hand.
*Tension the tail belt by using the tool kit to slide the boom backwards.
*Then slowly tighten the two red screws. (**Fig. 2**).

HOW TO USE THE TAIL BELT TENSION TOOL:

1. Push the plastic pad into its seat by unscrewing **the orange M2.5x12 screw**.
2. Install the tool on the boom, it needs to touch the H1454 clamp.
3. Tighten **the pink M2.5x10 screw** to lock the tool onto the boom.
4. Turn **the orange M2.5x12 screw** to tension the tail belt.
This will push the boom back, thus tightening the tail belt.
5. Once the correct tension is achieved, tighten the two boom clamps with **the two M2.5 screws**.
6. Remove the tool before flight.

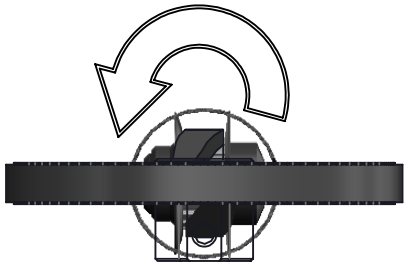


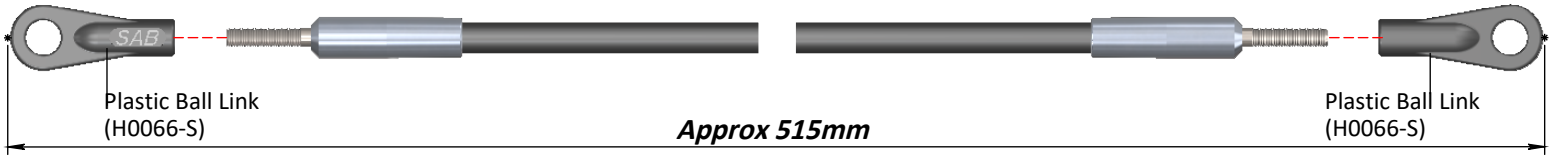
Fig. 1

Fig. 2

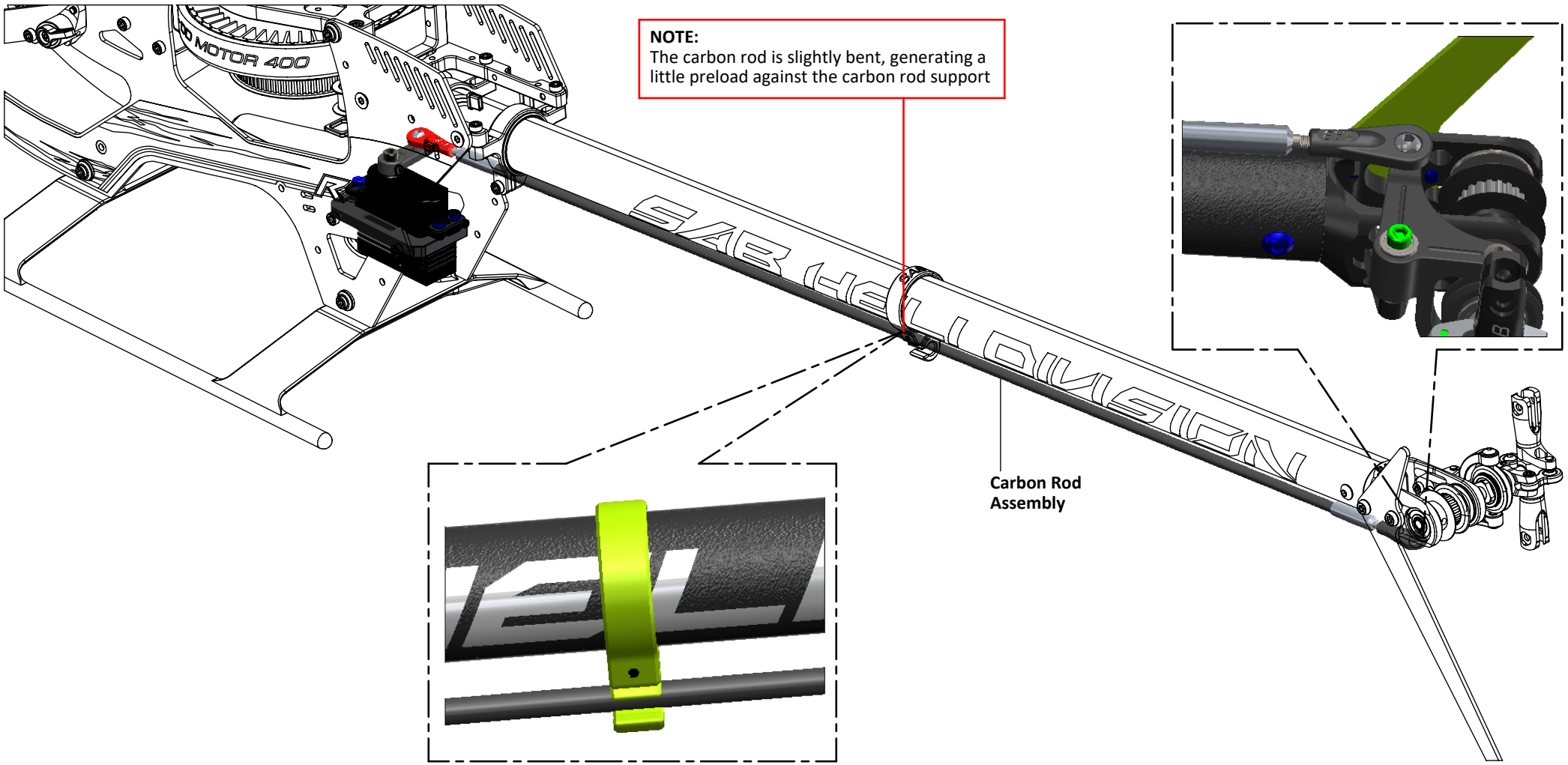
NOTE: Correct Tightening

Box 2, Bag for page 21

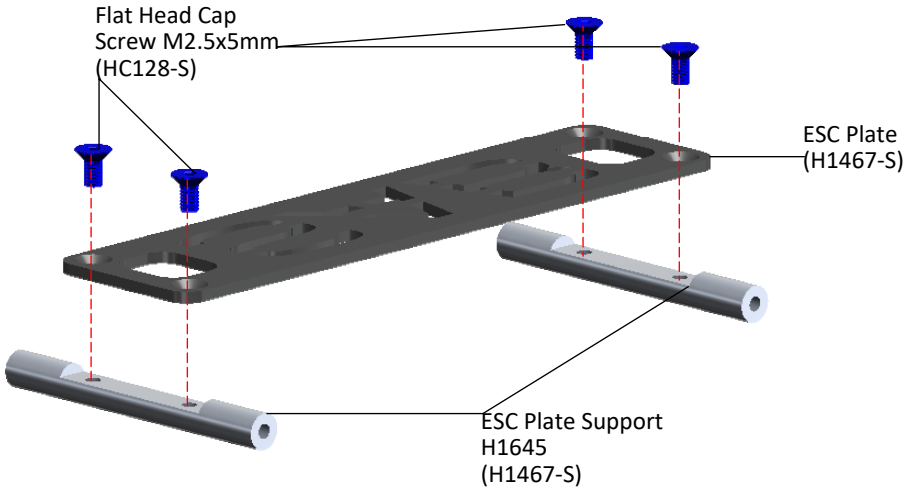
Before installing the plastic links onto the threaded rod, be sure that you have waited for at least 12 hours and glue is fully cured.



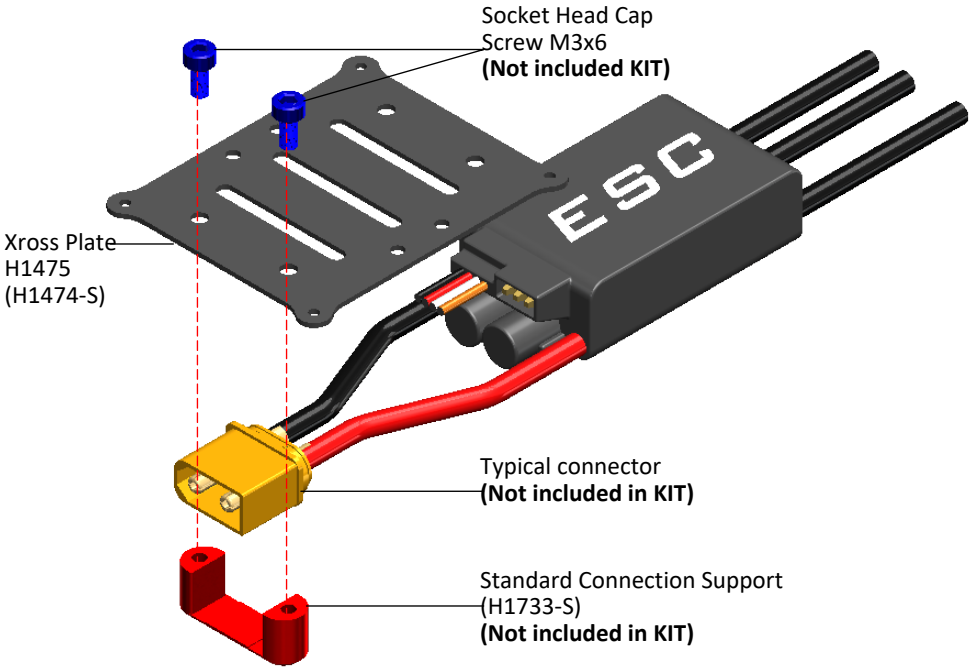
NOTE:
The carbon rod is slightly bent, generating a little preload against the carbon rod support



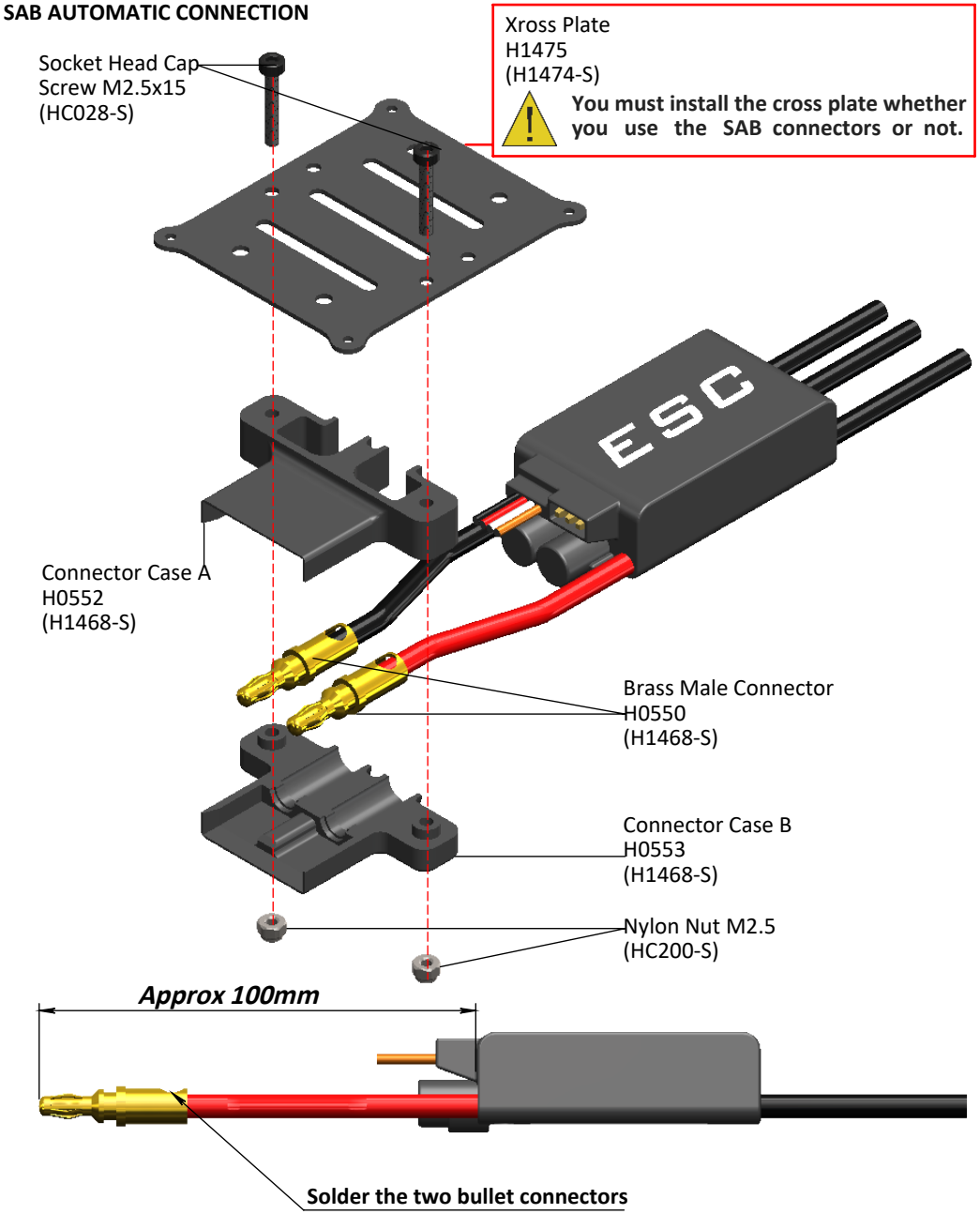
ESC PLATE ASSEMBLY

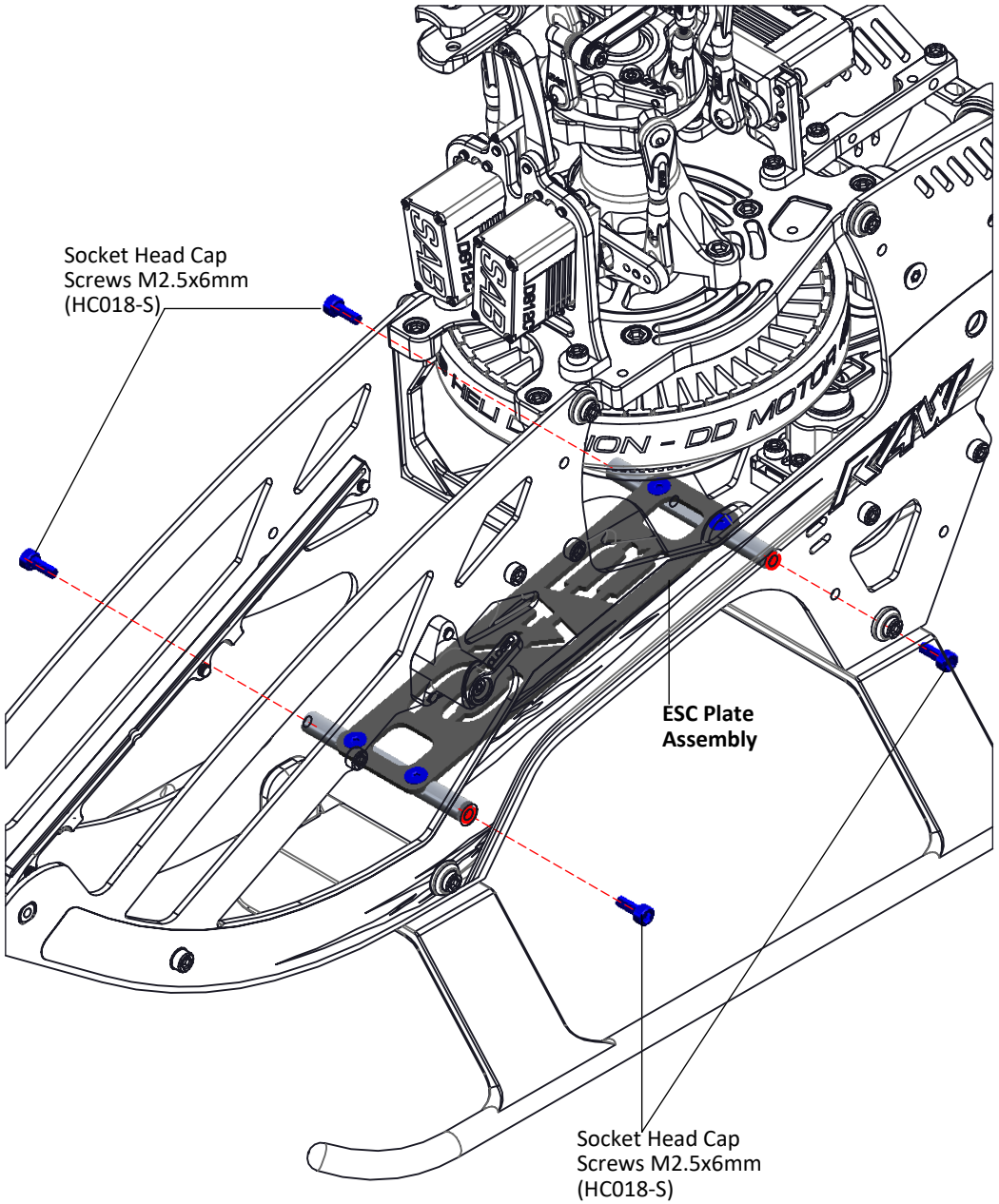


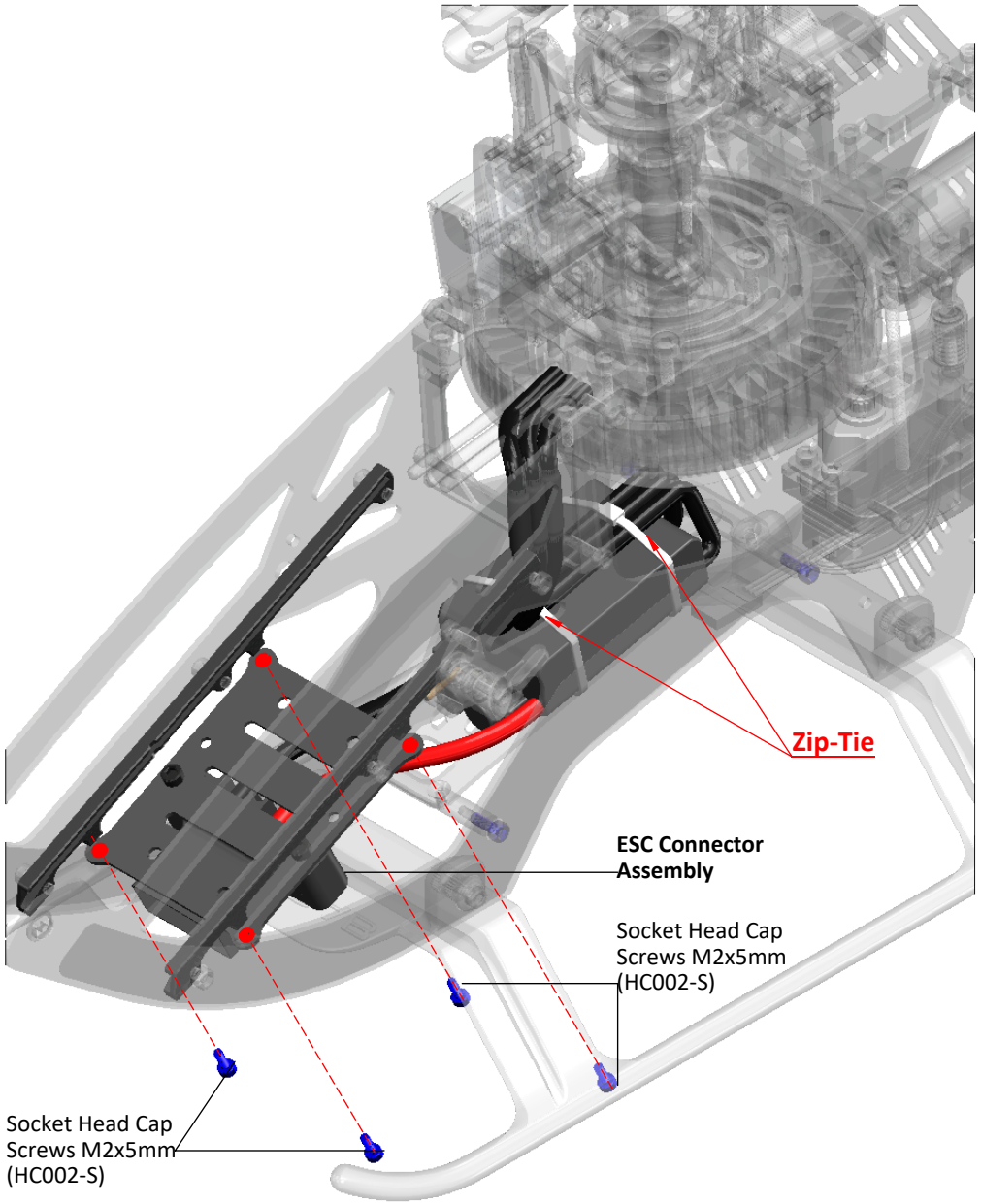
STANDARD CONNECTION

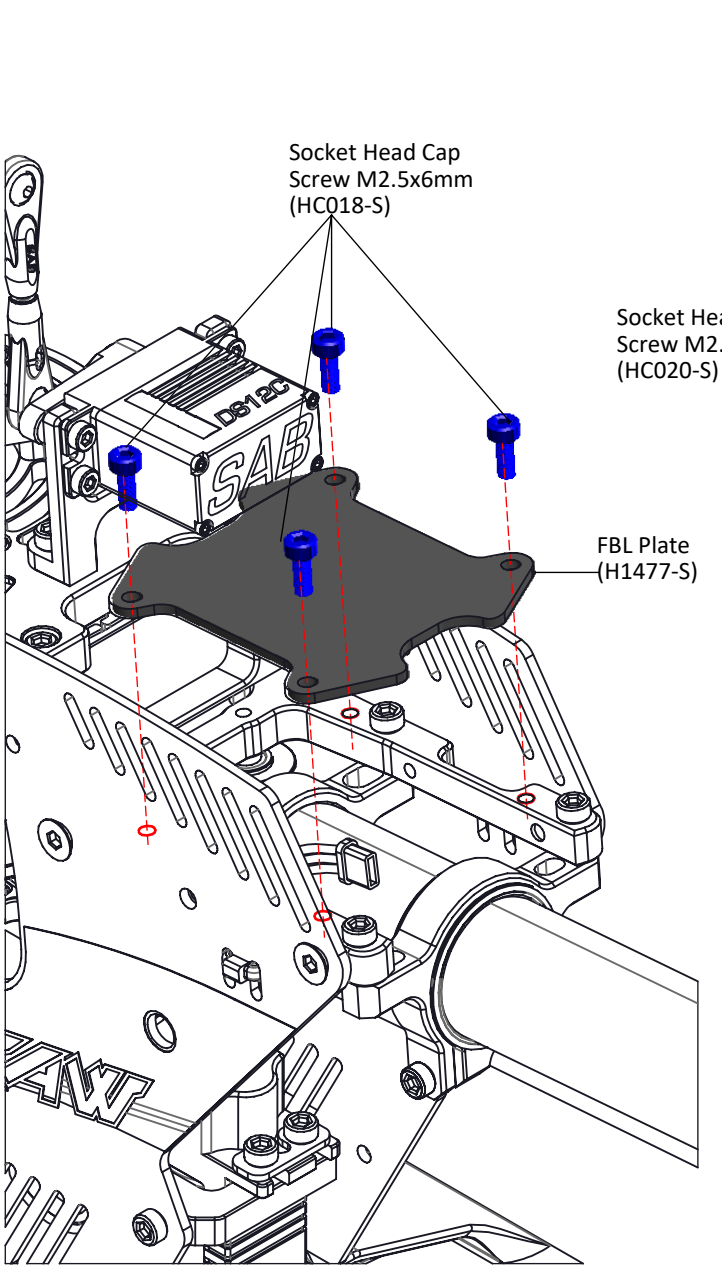


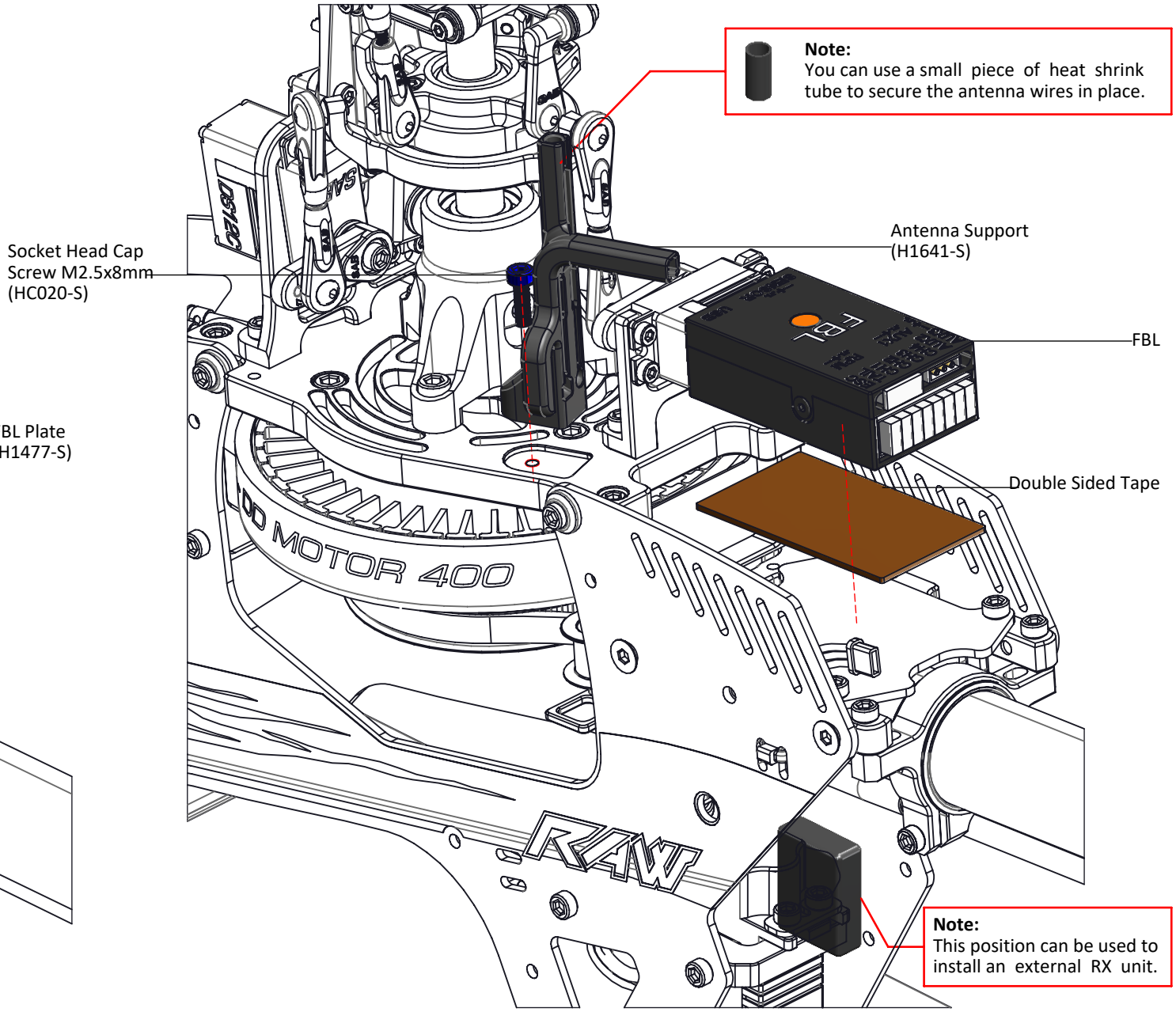
SAB AUTOMATIC CONNECTION




Socket Head Cap
Screws M2.5x6mm
(HC018-S)
ESC Plate
Assembly
Socket Head Cap
Screws M2.5x6mm
(HC018-S)

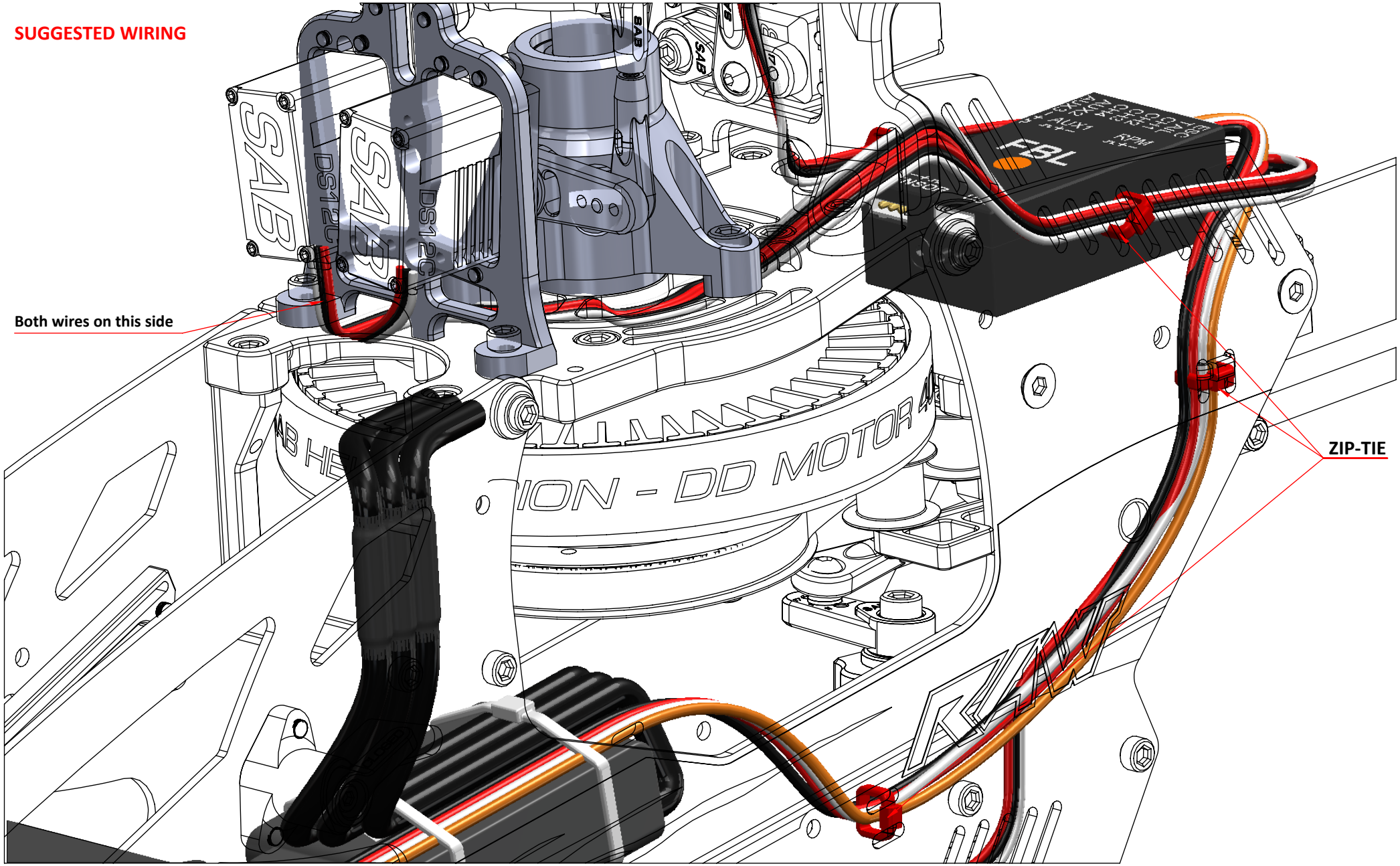

Zip-Tie
ESC Connector
Assembly
Socket Head Cap
Screws M2x5mm
(HC002-S)
Socket Head Cap
Screws M2x5mm
(HC002-S)


Socket Head Cap
Screw M2.5x6mm
(HC018-S)
FBL Plate
(H1477-S)

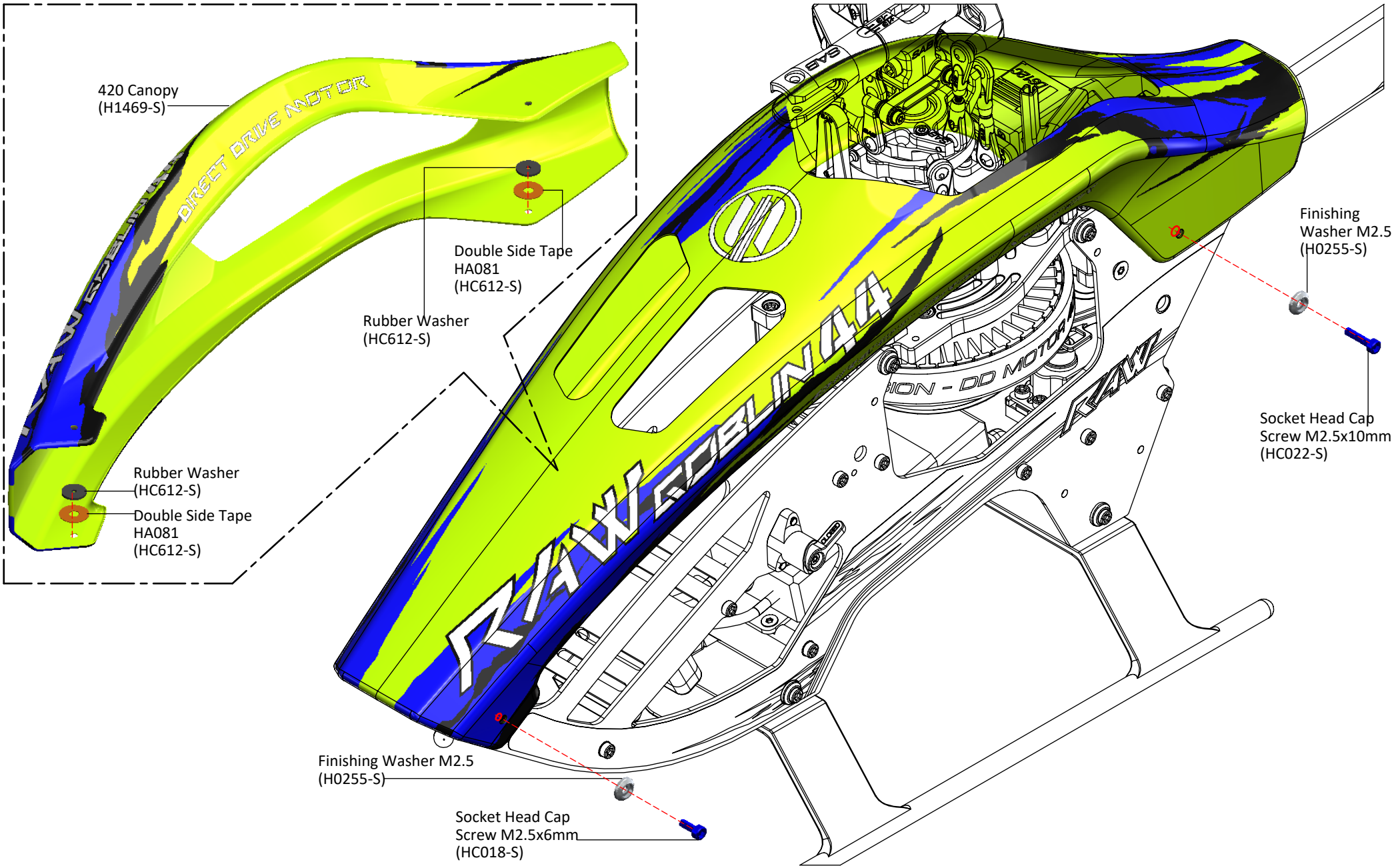

Note:
You can use a small piece of heat shrink tube to secure the antenna wires in place.
Socket Head Cap
Screw M2.5x8mm
(HC020-S)
Antenna Support
(H1641-S)
FBL
Double Sided Tape
Note:
This position can be used to install an external RX unit.

Box 2, Bag for page 25

SUGGESTED WIRING



Box 2, Bag for page 26

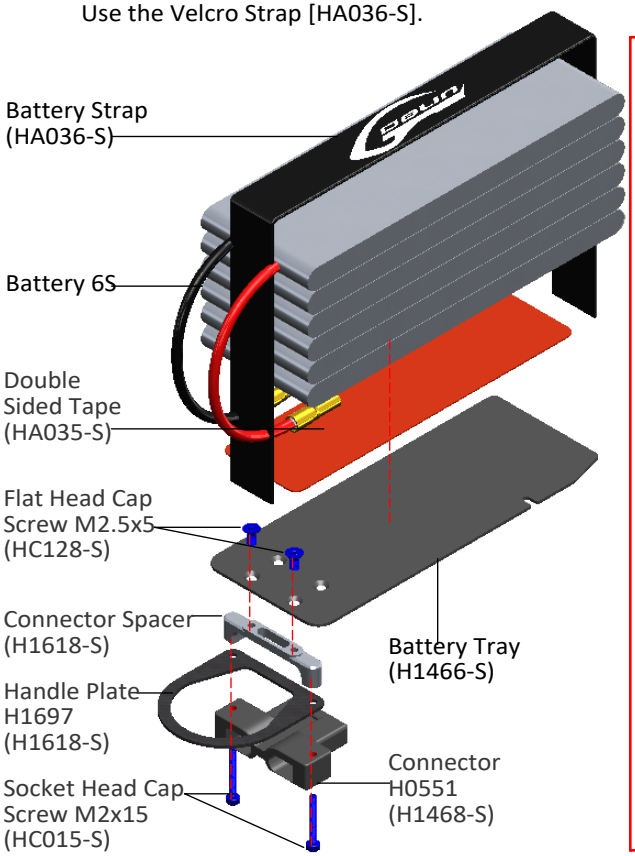


Box 2, Bag for page 27

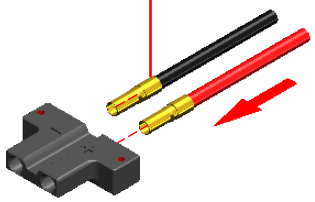
Before permanently mounting the battery on the battery tray, check the ideal position for the best center of gravity.

BATTERY ASSEMBLY

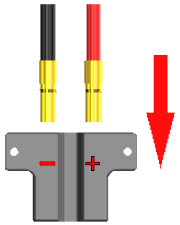
Use the included double sided tape to secure the battery to the tray.
Use the Velcro Strap [HA036-S].

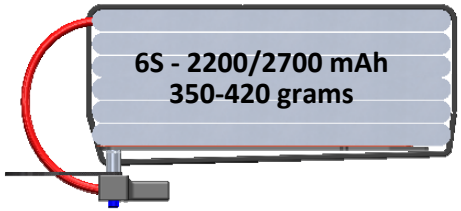


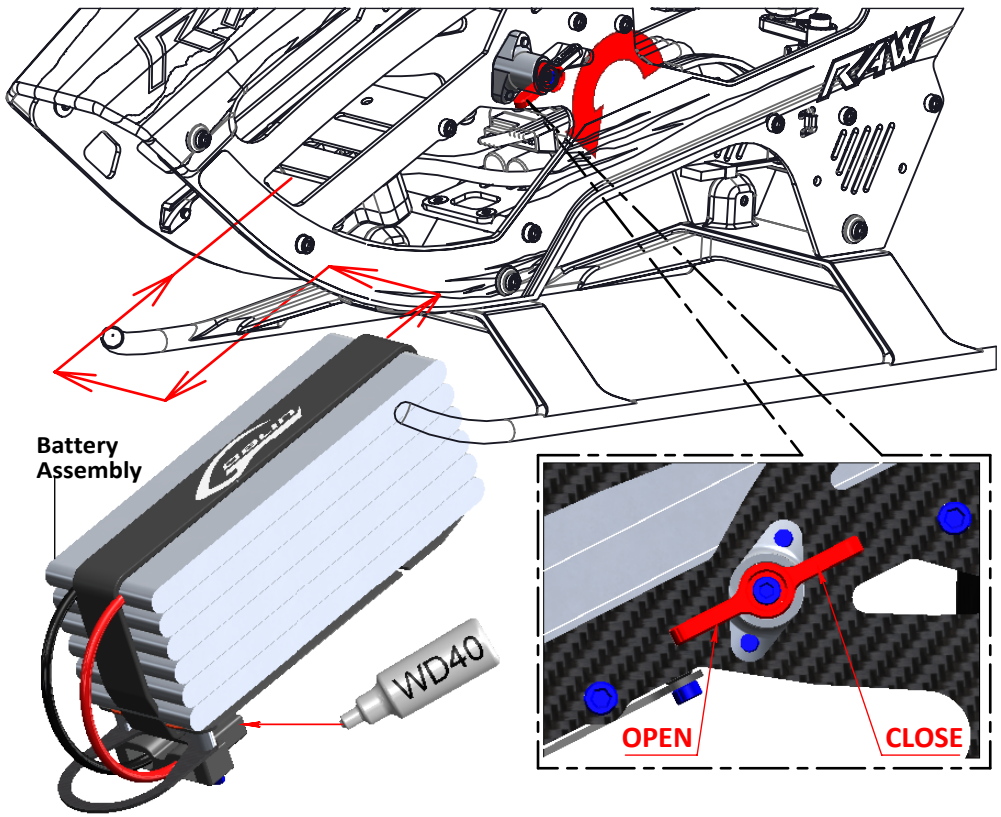
Solder the two connectors making sure you do not get solder on the outside of the connectors.



Insert the connectors by pushing firmly with a screwdriver or text tool (2.5mm tool works well)







* Lubricate the ESC and battery connectors with WD40. (If needed)
* The locking lever has 2 positions, Open and Closed.
* **The battery must be inserted with the lever in the closed position until a "click" is heard.**
* To remove the battery, rotate the lever 180 degrees to the open position and pull the tray out. We highly recommend to immediately turn the lever back to the closed position to avoid forgetting to lock the battery on the next flight.
* Always check that the battery is securely locked before each flight. You can check this by pulling on the battery, it should not come off if the lever is in the correct position and the battery tray is locked.

BOX 2, BAG FOR PAGE 28

SETUP

* Check that all wiring and connectors are securely in position.
* Set up the transmitter and flybarless system with utmost care.
* Test settings of the transmitter and flybarless system without the main and Tail blades fitted to ensure correct operation.

* Motor Setup:

  - POLES 42, KV 200.
  - RATIO 1:1.

* Set up of the RPM of the main rotor: Although it strongly depends on the brand of ESC you use, you can consider the below as an average:

  - 60% of the throttle >> 2400 rpm.
  - 70% of the throttle >> 2800 rpm.
  - 80% of the throttle >> 3200 rpm.

* **The forces acting on the mechanics increase enormously at higher RPM. For safety reasons we suggest not to exceed 80% of throttle (3200 RPM).**

* Fit the main blades and tail blades. (Fig.1 and Fig.2).
* Please ensure the main blades are tight on the blade grips, you should be able to forcefully jerk the head in both directions and the blades should not fold. Failure to tighten the blades can result in a boom strike during spool up.

* Check the collective and cyclic pitch. For 3D flight, set to about +/- 12.5°.
* It is important to check the tracking of the main blades.

FIRST FLIGHT

* Check that the connectors to the FBL / RX are all inserted correctly and secure.
* We suggest initially using a tail gain setting in your FBL system between 40 to 50%.

* **Check that the battery is securely locked and properly seated in the guides. The locking lever must always be oriented with the word closed facing upwards.**

* Perform the first flight at a low head speed, not exceeding 2400 rpm. After this first flight, do a general check of the helicopter. Verify that all the screws and bolts are correctly tightened.

* It's very important to check the model over before every flight, check all bolts, screws, belts, ball links, etc.

* If the model is making any strange noises check the blades balance.
  If you want to fly high RPM (over 3000 rpm) you can replace the tail pulley with H1742-S 21T .

Fig. 1

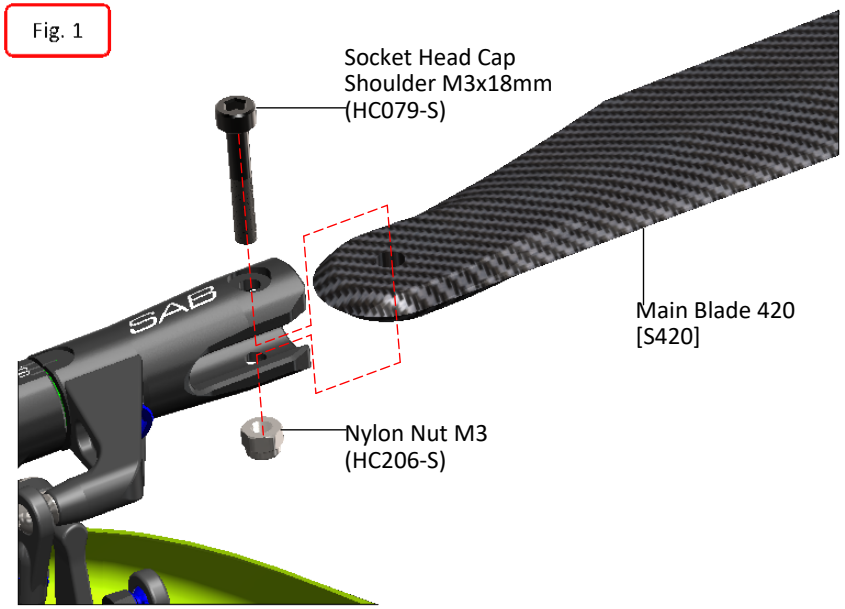
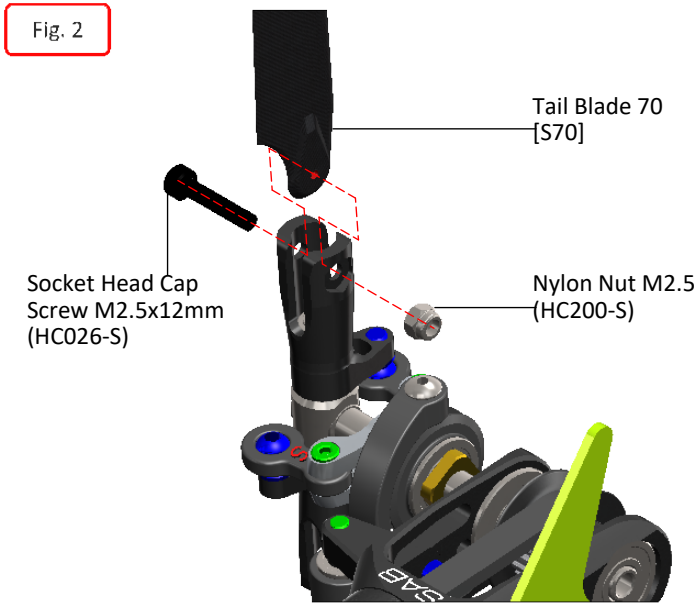


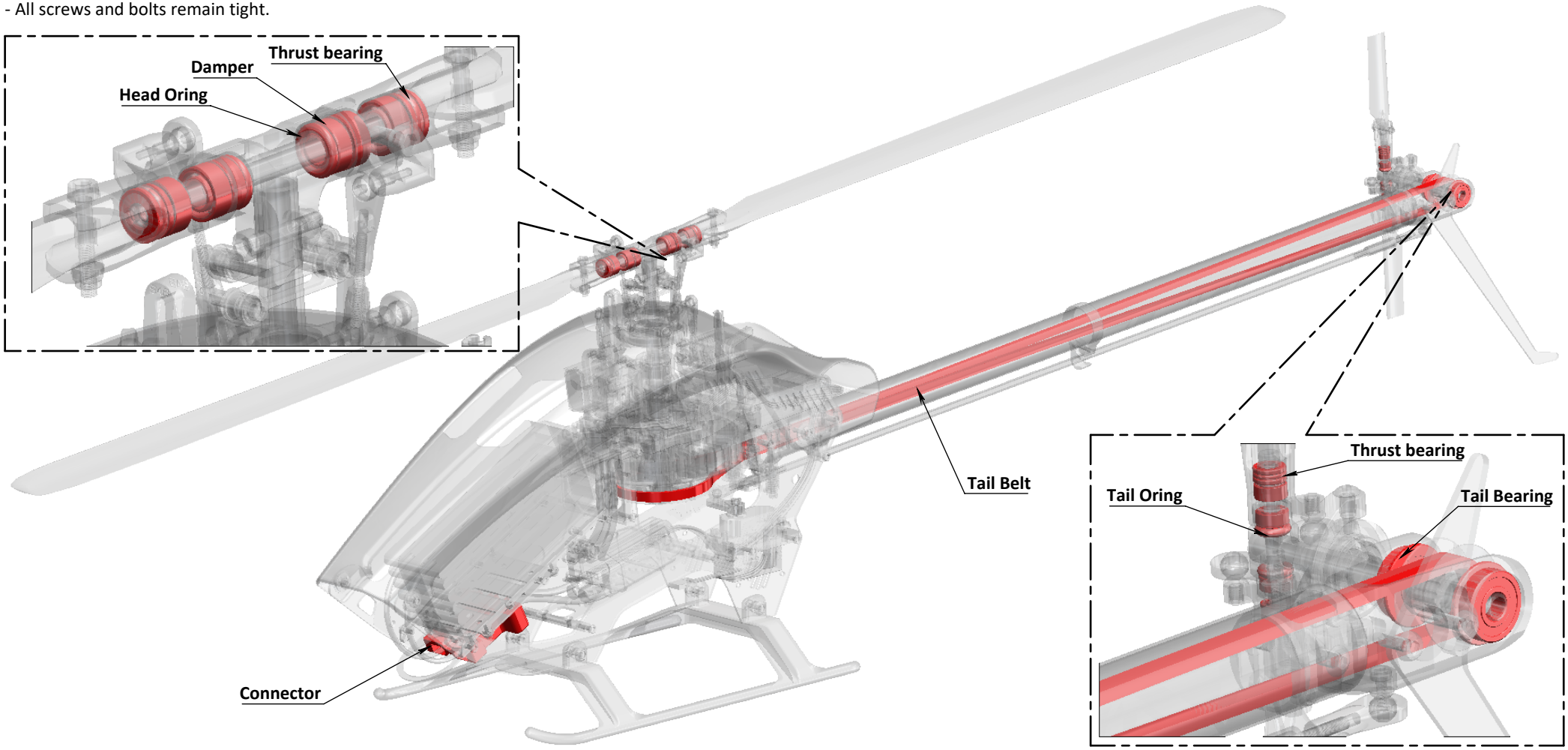
Fig. 2



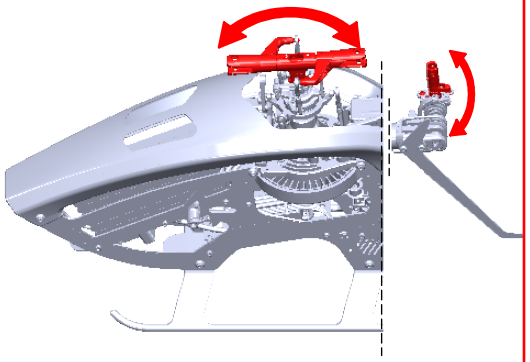
MAINTENANCE

Take a look at the red parts.
Check them frequently. All other parts are not particularly subject to wear.
The lifespan of these components varies according to the type of flying.
On average it is recommended to check these parts every 20 flights. In some instances, based on wear, these parts should be replaced every 100 flights.
Periodically lubricate the tail slider movement and its linkages as well as the swash plate movement and its linkages.

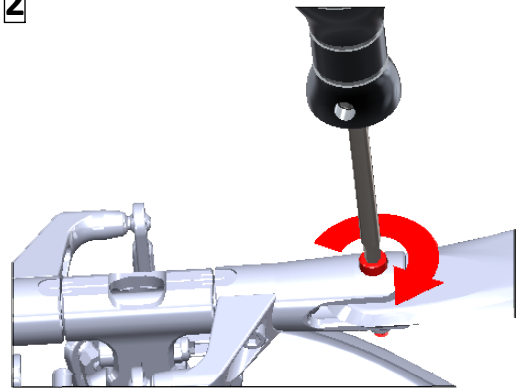
To ensure safety you should do a general inspection of the helicopter after each flight. You should check:
- Proper belt tension (engine belt and tail belt).
- Proper isolation of the wires from the carbon and aluminum parts.
- All screws and bolts remain tight.



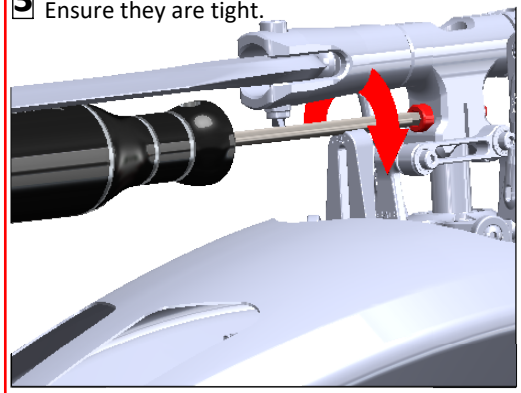
1 **Check the dampening on the main and tail rotor to be the same as always.**



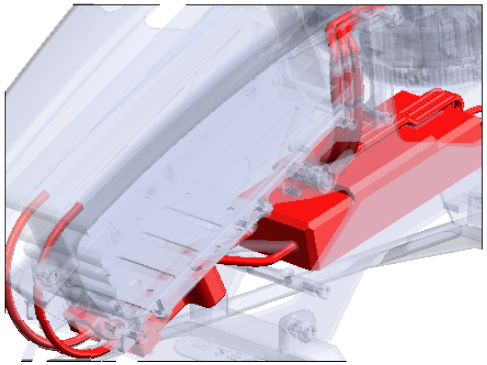
2 **Tighten the main blades before flight.**



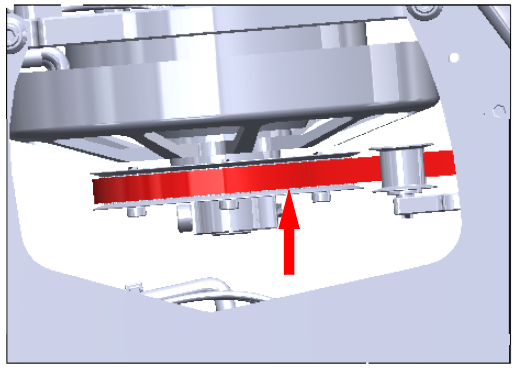
3 **Check main hub screws M3**
Ensure they are tight.



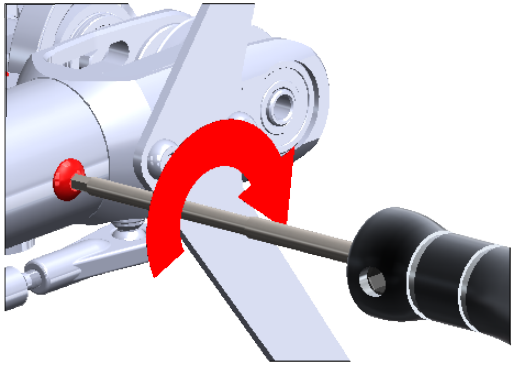
4 **Check all power connectors (Good mechanical connection).**



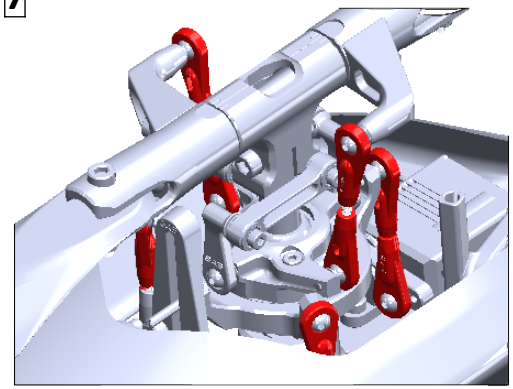
5 **Check Tail belt tension.**
The tension has to be tight.



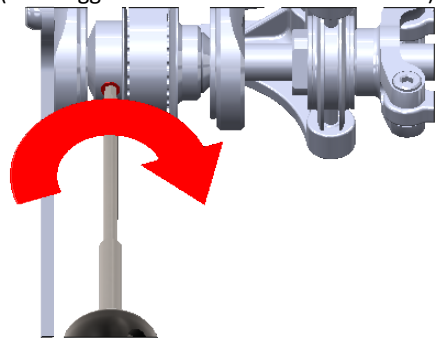
6 **Check the 2 M3 Tail group screws.**
Ensure they are tight.



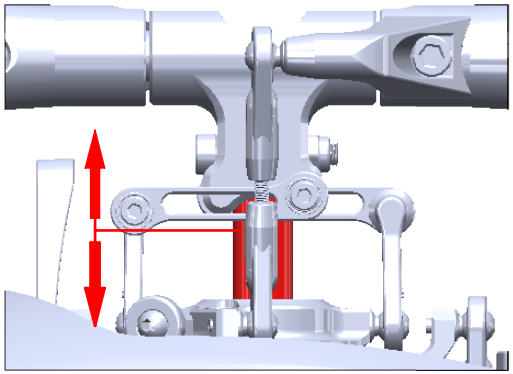
7 **Check the Main Linkages & Servo Linkages**



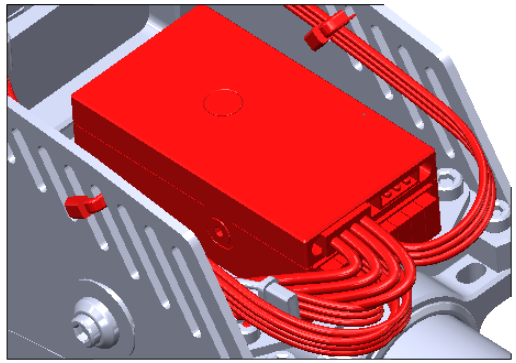
8 **Check tail pulley set screw:**
Ensure it is tight.
(It is suggested use a bit of Green Loctite.)



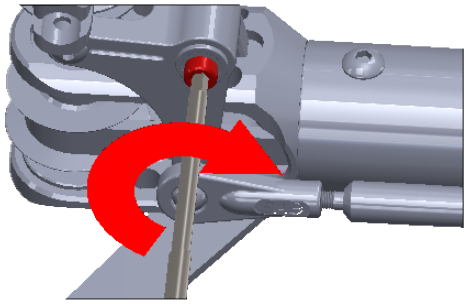
9 **Check for vertical play of the main shaft.**



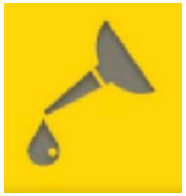
10 **Check if the FBL-RX connectors are OK (hot glue is recommended).**



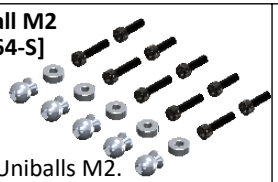
11 **Check the M2.5 bell crank:**
Belt crank movement must be smooth and the screw locked.
(It is suggested use a bit of Green Loctite.)



12 **Be sure the following parts are properly lubricated**
*Main shaft/swashplate
*Tail slider/tail shaft
*Carbon rod/carbon rod support
*All thrust bearings
*All plastic balls connections



Uniball M2
[H0064-S]



- 5 x Uniballs M2.
- 5 x Uniball Spacers.
- 5 x Head Cap Screws M2x8.
- 5 x Head Cap Screws M2x6.

Uniball M3
[H0065-S]

- 5 x Uniball M3.

Plastic Ball Link
[H0066-S]

- 10 x Plastic Ball Link.

Finishing Washer M2.5
[H0255-S]

- 10 x Finishing Washer M2.5.

Plastic Linkage
[H0261-S]

- 2 x Plastic Linkage.
- 2 x Spacers.
- 2 x Head Cap Screws M2x6.

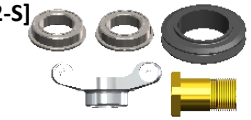
Plastic Ball Link M2
[H0403-S]

- 5 x Plastic Ball Link M2.

Main Spindle
[H0508-S]

- 1 x Main Spindle.
- 2 x Button Cap Screw M4x6.

Tail Spitch Slider
[H0512-S]



- 1 x Tail Spitch Slider 01.
- 1 x Tail Spitch Slider 02.
- 1 x Tail Spitch Slider 03.
- 2 x F.Bearing ∅ 7x ∅ 11x2.5.

Radius Arm
[H0516BM-S]

- 2 x Swashplate Arm.
- 2 x Radius Plastic Arm.
- 4 x Head Cap Screws M2x10mm.
- 2 x Washer ∅ 2,2x ∅ 5 x 0,3mm.
- 8 x F.Bearing ∅ 2x ∅ 5x2.5mm.

Damper Set
[H0518-S]

- 2 x Damper.
- 2 x Oring 106, 1.78 x 6.75.
- 2 x Shims ∅ 5x ∅ 7 x 0,1mm.
- 2 x Washer ∅ 7,5 x ∅ 10x0,5.
- 2 x Button Head Screw M4x6.

Radius Plastic Arm
[H0525-S]

- 2 x Radius Plastic Arm.
- 2 x Washer ∅ 2,2x ∅ 5 x 0,3mm.

Uniball M2
[H0538-S]

- 5 x Uniball M2.

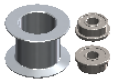
Tail Spacers Set
[H0540-S]

- 2 x Washer ∅ 3 x ∅ 4.75x0,5.
- 2 x Washer ∅ 4.5x ∅ 5.9x0,5.
- 2 x Washer ∅ 2,1x ∅ 4,5x0,5.
- 2 x Head Cap Screws M2x6mm.
- 2 x Oring 2012, DI=2,9, S=1,78.

Washer
[H0566-S]

- 10 x Washer ∅ 2,1x ∅ 4,5x0,5.

Tail Belt Ilder
[H0575-S]



- 1 x Tail Belt Ilder.
- 2 x F.Bearing ∅ 2,5x ∅ 6x2,6.

Serial Number
[H1212-S]

- 1 x Serial Number.
- 1 x Flat Screw M2.5x5.

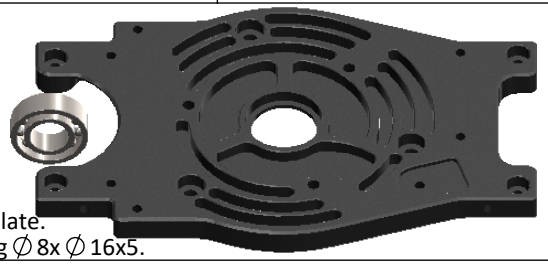
Center Hub
[H1445-S]

- 1 x Center Hub.
- 1 x Head Cap Shoulde M3x16.
- 1 x Nylon Nut M3.

Main Blade Grip
[H1446-S]

- 2 x Main Blade Grip.
- 4 x Bearing ∅ 5x ∅ 10x4.
- 2 x Washer ∅ 7.5x ∅ 10x0,5.
- 2 x Thrust Bearing ∅ 5x ∅ 10x4.
- 2 x Button Head Screw M4x6.

Main Plate
[H1448-S]



- 1 x Main Plate.
- 1 x Bearing ∅ 8x ∅ 16x5.

Rear Frame Spacer
[H1449-S]

- 1 x Rear Frame Spacer.

Front Frame Spacer
[H1450-S]

- 1 x Front Frame Spacer.

Boom Block Support
[H1452-S]

- 1 x Boom Block Support.

Front Boom Block
[H1453-S]

- 1 x Front Boom Block.
- 2 x Head Cap Screws M2.5x10
- 1 x Head Cap Screws M2.5x12.
- 1 x Nylon Nut M2.5.

Rear Boom Block
[H1454-S]

- 1 x Rear Boom Block.
- 1 x Rear Boom Block Ring.
- 2 x Head Cap Screws M2.5x10.
- 1 x Head Cap Screws M2.5x12.
- 1 x Nylon Nut M2.5.

Tube Boom
[H1455-S]

- 1 x Tube Boom.

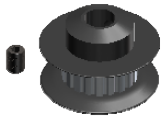
Tail Case
[H1456-S]

- 1 x Tail Case.
- 2 x Button Cap Screw M3x4.
- 2 x F.Bearing ∅5x∅13x4.

Bell Crank Base
[H1457-S]

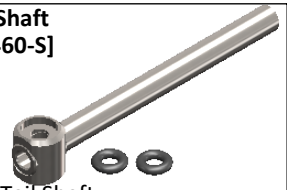
- 1 x Bell Crank Base.
- 2 x Head Cap Screw M2x6.

Tail Pulley 20T
[H1459-S]



- 1 x Tail Pulley 20T.
- 1 x Set Screw M3x4.

Tail Shaft
[H1460-S]



- 1 x Tail Shaft.
- 1 x Tail Hub.
- 2 x Tail Oring.

Tail Blade Grip
[H1461-S]

- 2 x Tail Blade Grip.
- 2 x Washer ∅4,5 x∅5.9x0,5.
- 2 x Washer ∅2.1 x∅4.5x0,5.
- 2 x Socket Head Screw M2x6.
- 2 x Thrust Bearing ∅3 x∅6x2.8.
- 2 x Bearing ∅3 x∅7x3.
- 2 x Bearing ∅3 x∅6x2.5.

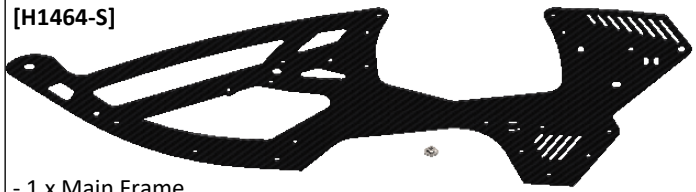
Tail Fin
[H1462-S]

- 1 x Tail Fin.
- 2 x Button Head Cap M2,5x6 Special.

Carbon Rod Support
[H1463-S]

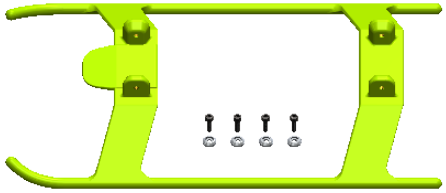
- 1 x Carbon Rod Support.
- 1 x Head Cap Screw M2x10mm.

Main Frame
[H1464-S]



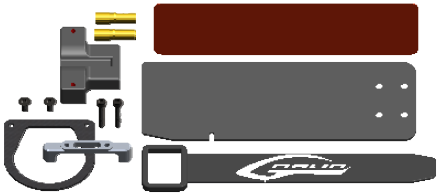
- 1 x Main Frame.
- 1 x Bushing.

Landing Gear
[H1465-S]



- 1 x Landing Gear.
- 4 x Finishing Washer M2.5.
- 4 x Head Cap Screw M2.5x8.

Battery Tray
[H1466-S]



- 1 x Connector.
- 1 x Battery Tray.
- 1 x Handle Plate.
- 1 x Battery Strap.
- 1 x Battery Spacer.
- 1 x Double Side Tape.
- 2 x Flat Cap Screw M2.5x5.
- 2 x Brass Male Connector.
- 2 x Head Cap Screw M2x15.

ESC Plate
[H1467-S]

- 1 x ESC Plate.
- 2 x ESC Support.
- 4 x Flat Cap Screw M2.5x5.

Connector Case
[H1468-S]

- 1 x Connector Case SET.

420 Canopy
[H1469-S]

- 1 x 420 Canopy.
- 2 x Rubber Washer.
- 2 x Double Side Tape.

Main Shaft
[H1470-S]

- 1 x Main Shaft.

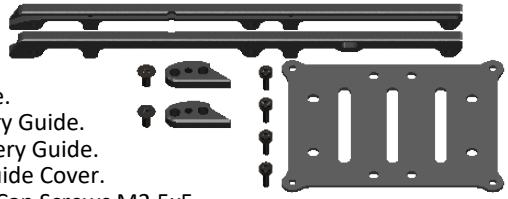
Tail Servo Mount
[H1471-S]

- 1 x Tail Servo Mount.
- 2 x Servo Spacer.
- 4 x Head Cap Screws M2.5x8.

Bearing Support
[H1473-S]

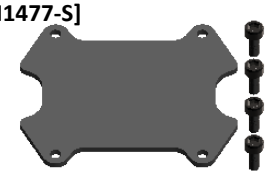
- 1 x Bearing Support.
- 1 x Bearing ∅8x∅16x5.
- 3 x Head Cap Screws M3x10.

Battery Guide
[H1474-S]



- 1 x Xross Plate.
- 1 x Left Battery Guide.
- 1 x Right Battery Guide.
- 2 x Battery Guide Cover.
- 2 x Flat Head Cap Screws M2.5x5.
- 4 x Head Cap Screws M2x5.

FBL Plate
[H1477-S]

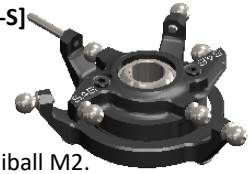


- 1 x FBL Plate.
- 4 x Head Cap Screws M2.5x6.

Tensioner Base
[H1517-S]

- 1 x Tensioner Base.
- 1 x Tail Belt Ilder.
- 1 x Tensioner Block.
- 1 x Spring Support.
- 1 x Shim.
- 1 x Spring.
- 2 x Head Cap Screw M2.5x10.
- 1 x Head Cap Screw M2.5x19.
- 4 x F.Bearing ∅2.5x∅6x2.6.

Swashplate
[H1566-S]



- 7 x Uniball M2.
- 1 x Reference Pin.
- 1 x Swashplate ASM.

Main Shaft Block
[H1567-S]

- 1 x Main Shaft Block.
- 2 x Set Screw M4x4.

Front Servo Mount
[H1568-S]

- 1 x Front Servo Mount.
- 2 x Head Cap Screws M2.5x8.

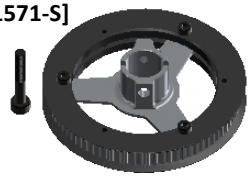
Rear Servo Mount
[H1569-S]

- 1 x Rear Servo Mount.
- 2 x Head Cap Screws M2.5x8.

One Way Bushing
[H1570-S]

- 1 x One Way Bushing.

Front Tail Pulley
[H1571-S]



- 1 x Front Tail Pulley Assembly.
- 1 x Head Cap Shoulder M3x18.

Antenna Support
[H1641-S]

- 1 x Antenna Support.
- 1 x Head Cap Screws M2.5x8.

Anti-rotation
[H1687-S]

- 1 x Anti-Rotation.
- 3 x Head Cap Screws M2x6.

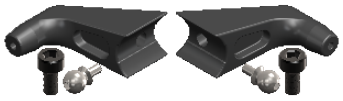
Tail Spindle
[H1689-S]

- 1 x Main Spindle.
- 2 x Socket Cap Screw M2x6.
- 2 x Washer ∅ 2.1x ∅ 4.5x0.5.

Battery Lock
[H1694-S]

- 1 x Shim.
- 1 x Battery Lock Base.
- 1 x Battery Lock CAM.
- 1 x Battery Lock Pin.
- 1 x Battery Lock Spring.
- 1 x Head Cap Screw M2x6.

Blade Grip Arm
[H1701-S]



- 2 x Blade Grip Arm.
- 2 x Uniball M2.
- 2 x Head Cap Screw M3x6mm.

Bell Crank Clever
[H1702-S]

- 1 x Bell Crank Clever.
- 1 x Uniball M2.
- 1 x Bushing.
- 2 x Tail Pin.
- 1 x Head Cap Screw M2x5.
- 2 x F.Bearing ∅ 2.6x ∅ 6x2.6.
- 1 x Head Cap Screw M2.5x18.

Tensioner Boom
[H1703-S]

- 1 x Clamp 01.
- 1 x Clamp 02.
- 1 x Clamp 03.
- 1 x Oring 3x0.8.
- 1 x Head Cap Screw M2.5x10.
- 1 x Head Cap Screw M2.5x12.
- 1 x Head Cap Screw M2.5x18.

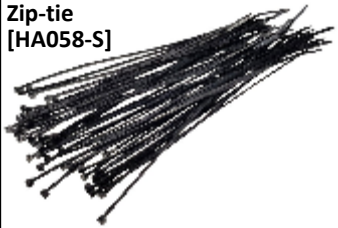
Double Side Tape
[HA035-S]

- 2 x Double Side Tape.

Battery Straps
[HA036-S]

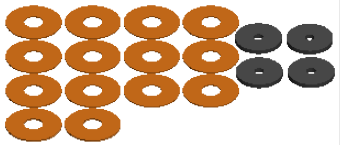
- 2 x Battery Straps.

Zip-tie
[HA058-S]



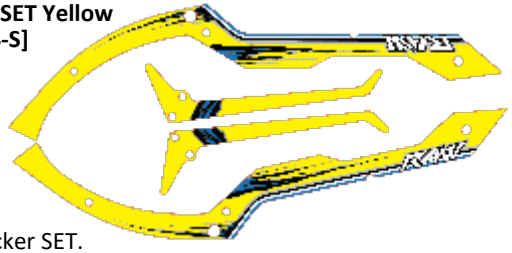
- 50 x Zip-tie.

Double Side Tape
[HA081-S]



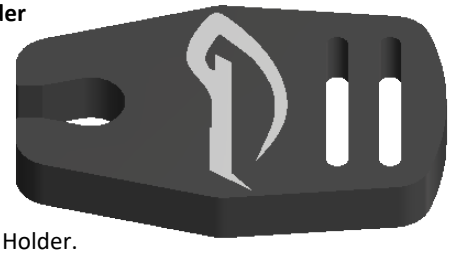
- 4 x Rubber Washer.
- 14 x Double Side Tape.

Sticker SET Yellow
[HA094-S]



- 1 x Sticker SET.

Blade Holder
[HA119-S]



- 1 x Blade Holder.

[HE028-S]

- 1 x SAB DD MOTOR 8210-210.

[S420]

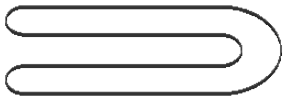
- 2 x Main Blade 420.

[H1461W-S]

- 10 x Washer ∅ 2.6x ∅ 10x0.1 .

[S70]

- 2 xTail Blade 70.

[HC001-S]  - 10 x Button Head Cap Screws M2x6mm.	**[HC002-S]**  - 10 x Socket Head Cap Screws M2x5mm.	**[HC004-S]**  - 10 x Socket Head Cap Screws M2x6mm.	**[HC010-S]**  - 10 x Socket Head Cap Screws M2x10mm.	**[HC018-S]**  - 10 x Socket Head Cap Screws M2.5x6mm.	**[HC019-S]**  - 10 x Special Head Cap Screws M2.5x6mm.	**[HC020-S]**  - 10 x Socket Head Cap Screws M2.5x8mm.
[HC022-S]  - 10 x Socket Head Cap Screws M2.5x10mm.	**[HC026-S]**  - 10 x Socket Head Cap Screws M2.5x12mm.	**[HC028-S]**  - 10 x Socket Head Cap Screws M2.5x15mm.	**[HC032-S]**  - 10 x Socket Head Cap Screws M2.5x18mm.	**[HC038-S]**  - 10 x Button Head Cap Screws M3x4mm.	**[HC044-S]**  - 10 x Socket Head Cap Screws M3x6mm.	**[HC050-S]**  - 10 x Socket Head Cap Screws M3x8mm.
[HC056-S]  - 10 x Socket Head Cap Screws M3x10mm.	**[HC062-S]**  - 10 x Socket Head Cap Screws M3x12mm.	**[HC074-S]**  - 2 x Shoulder Screws M3x16. - 2 x Nylon Nut M3.	**[HC079-S]**  - 2 x Shoulder Screws M3x18.	**[HC096-S]**  - 10 x Button Head Cap Screws M4x6mm.	**[HC128-S]**  - 10 x Flat Head Cap Screws M2.5x5mm.	**[HC134-S]**  - 10 x Flat Head Cap Screws M3x8mm.
[HC140-S]  - 10 x Set Screws M2.5x18.	**[HC152-S]**  - 10 x Set Screws M4x4.	**[HC170-S]**  - 10 x Washer ∅ 2.1x ∅ 5x0.3.	**[HC200-S]**  - 10 x Nylon Nut M2.5.	**[HC206-S]**  - 10 x Nylon Nut M3.	**[HC411-S]**  - 4 x Bearing ∅ 5x ∅ 10x4.	**[HC412-S]**  - 4 x F. Bearing ∅ 5x ∅ 13x4.
[HC419-S]  - 2 x Bearing ∅ 8x ∅ 16x5.	**[HC422-S]**  - 4 x Bearing ∅ 10x ∅ 19x5.	**[HC435-S]**  - 2 x Thrust Bearing ∅ 5x ∅ 10x4mm.	**[HC448-S]**  - 2 x Thrust Bearing ∅ 3x ∅ 6x2.8mm.	**[HC450-S]**  - 10 x Washer ∅ 5x ∅ 7x0.1.	**[HC453-S]**  - 2 x Oring 1.78x2.9. - 2 x Oring 1.78x6.75.	**[HC456-S]**  - 4 x Flanged Bearing ∅ 2x ∅ 5x2.5mm.
[HC457-S]  - 4 x Ball Bearing ∅ 3x ∅ 7x3.	**[HC464-S]**  - 1 x Belt HTD 2M - 1250.	**[HC496-S]**  - 10 x Head Screws M1.6x4.	**[HC499-S]**  - 10 x Set Screws M2.5x4.	**[HC626-S]**  - 10 x Set Screws M2x18.	**[HC627-S]** - 1 x Carbon Rod ∅ 2.5x ∅ 4x460mm. - 2 x Plastic Ball Linkage - 2 x Thread Rod M2.5x40. - 2 x Aluminum Bush.	

FLY SAFE

GOBLIN RAW 420

Release 1.0 - August 2022

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